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PUBLICATION













Check these Properties and Typical Uses of





Physical and Chemical Properties

Molecular Weight: 79.06

Solubility in Water: 14% at 10°C., 17.4% at 20°C., and 21.3% at 30°C.—Insoluble in alcohol.

Negative heat of solution

Stability: Relatively stable at room temperatures.

Volatility increases sharply above 140°F.
Decomposition product ratios are as follows:

Carbon dioxide gas (CO₂)......55.7%

Water vapor (H₂0)22.8%

pH of 1/10 N solution at 25°C.: 7.8 Appearance: White Crystals

Quality: Exceptionally pure. Food grade.

Very low metal content.

Some Typical Uses of AMMONIUM BICARBONATE

Gypsum removal from heat exchangers and other processing equipment

Fluffing and adding bulk to cookies, biscuits, baked pet foods

Mold expansion of rubber products

Creation of voids for cellular products

Cold wave solutions

Chrome leather tanning



UF-9

From biscuits to plastics . . . from chrome leather processing to cold wave solutionsthese are the varied fields in which Solvay these are the varied fields in which Solvay Ammonium Bicarbonate has already found important use. The properties and unusual features of this versatile product suggest many other uses; it may find application in your operations.

Solvay Ammonium Bicarbonate is a safe. low-cost source of ammonia and carbon dioxide. It can be used to create voids, decrease density and add bulk in plastic materials. It converts acid-insoluble gypsum to easily removed carbonates. It is an exceptionally effi-cient neutralizing agent, although it has an unusually low pH. It has higher neutralizing value than either borax or sodium bicarbonate and yet a 1/10 N solution at 25°C. has a pH of only 7.8.

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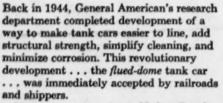
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Chemical

Week

Volume 77

September 10, 1955

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MOTOR FACTS ON INDUSTRY'S MOST PREFERRED "POWER PACKAGE" Electrical System Fact—Only the new Life-Line "A" motor gives you the unsurpassed corrosion-resistant protection of exclusive new Bondar, Bondite and Mylar* insulations.

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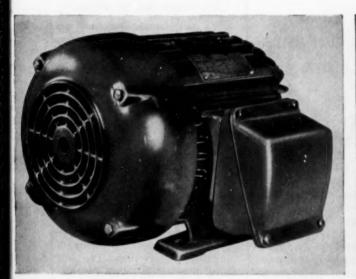
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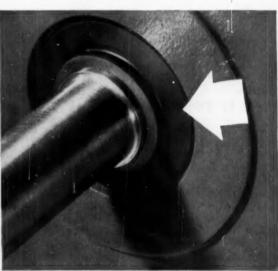
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OPINION ...

Job Lures

TO THE EDITOR: . . . The concern that has been expressed in various quarters-justifiably or not-regarding the fewness of students who are studying engineering or the sciences . . . is a subject you have reported on and discussed from time to time . . .

With that in mind, I thought you might be interested in the problem that Britain and Canada have . . . a concern that the U.S. A. does not share . . . It is outlined in the enclosed editorial from the Winnipeg Tribune . . .

HOWARD R. DONNELLY Winnipeg, Man.

Thanks. The enclosure: "Great Britain is becoming alarmed over a problem that has long plagued Canadahow to keep its university graduates in their own country. With the university year just ended, British technological journals blossomed forth with advertisements from U.S. firms offering high salaries to young scientists and extolling the attractive living conditions in America. One estimate is that not less than 500 science graduates leave Britain every year for the United States or for other parts of the Commonwealth . . . though Britain itself has an unsatisfied demand for 15,000 graduate engineers . . . "-ED.

Chemicals for Satellites

TO THE EDITOR: Re your news article on Western Electrochemical Co. . . . (Aug. 6), the statement regarding expanding civilian use of ammonium perchlorate has apparently been misunderstood by some prospective customers. . . . Your reference to civilian use, although technically correct, has been construed as nongovernmental use. Inasmuch as ammonium perchlorate is a restricted product, it is not currently available to private industry. It is available only for governmental projects, but is definitely not limited to the military.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St. New York 36, N. Y.

Your report nicely coincided with the White House announcement of outer-space satellites. It is likely that solid propellants made from perchlorates will be used for the launching of such satellites and other experimental rockets.

No doubt, in due course, private industry not only will be permitted to use ammonium perchlorates, but also may be, in some instances, compelled to do so. We refer to possible regulations requiring passenger airliners to carry Jato units for emergency acceleration.

Such a requirement would be a protection against calamities such as the Elizabeth, N. J., plane crashes of a few years ago . . .

ROBERT S. BURNS
President
Western Electrochemical Co.
Culver City, Calif.

Chemists' Contract

To the Editor: Your feature news article "Proposed for Professionals: Standard Pact" (Aug. 13) discussed the AIC contract developed by the subcommittee of their Employer-Employee Relations Committee.

This contract was developed only after months of painstaking consideration of many others now in use, and after consultation with persons experienced in such matters. We believe it was a carefully balanced document, which attempted to protect the rights and define the obligations of both professional employee and employer.

The portions of this contract that you quoted so expertly out of context omitted the balancing portions so as to convey meanings completely foreign to the wording and spirit of the contract. Since the quoted criticisms were directed at these improper excerpts, they are largely irrelevant and confusing.

Most chemists and chemical engineers consider themselves as belonging to a profession, and scientific organizations consider them as members of a professional group. The contract our committee developed was based upon the fact that chemists are professionals and are not to be considered as a collective bargaining group. It is our opinion that management also considers chemists and chemical engineers as members of a profession. The AIC

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model contract was not intended to cover all details of working conditions that affect all types of workers, but to deal with those factors that pertain especially to professional employees.

It is true that in recent years collective bargaining organizations have tried to make inroads into the field of industrial chemistry by attempting to organize professional chemists to become members of their groups. . . . by attempting to include scientific personnel with industrial chemical workers and operators. Of course, there is a difference, and, in the contract, our committee endeavored to make this definite differentiation clearly under-

We are sure your report will attract management's attention to the fact that the choice between such a contract as we developed and a collective bargaining group must be seriously considered and soon; from that point of view what you published should be a valuable contribution. . . . It is hoped that when such a decision is made by management they will give favorable thought to our contract in view of the fact that the majority of us in chemistry and chemical engineering consider ourselves professionals.

We feel the AIC contract provides protection both for employers and for professional employees. If the critics of the contract have some written agreements in mind that will accomplish both of these things more effectively, we hope they will publish such contracts for the good of the chemical profession and chemical industry. . . .

In all fairness . . . we believe you should reprint the complete AIC contract and allow your readers to judge its merits for themselves.

> LLOYD A. HALL Consulting Chemist Chicago

CW saw, and sees, no point in burdening busy readers by printing the entire text of a model contract. Moreover. CW denies that its reportingconfined as it clearly was to a discussion of the elements that have drawn comment from various critics-was

Suggestion: readers who are also interested in the more conventional (and less controversial) sections of the contract may obtain a copy of the entire contract by writing to the AIC, 60 W. 42nd St., New York.-ED.

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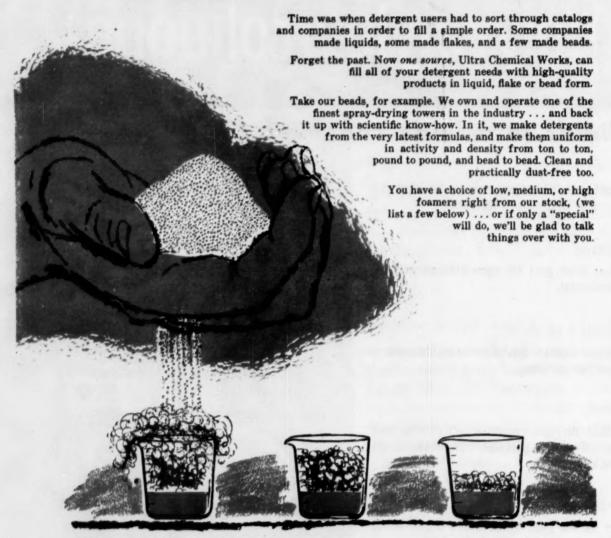
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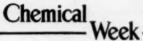
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BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

Solidifying belief that chemical companies expect 1955 will be a banner year are late Commerce Dept. statistics on dividend payments.

Up to July 31, chemical firms had paid out \$359.8 million in cash to stockholders; July's total alone ran to \$21.3 million—a 65% boost over 1954.

Significant also is word from the Federal Power Commission that a proposal has been made concerning construction of a natural gas pipeline to Florida—one of the last major areas in the U. S. without pipelines.

Some \$152 million in new Florida chemical construction projects has been completed within the past 12 months and \$83.6 million had been planned for the next three years. The advent of pipelined gas will mean (1) the launching of more new ventures, (2) broader, more economical operations in a number of already-built plants.

Want to buy a tin smelter? The Federal Facilities Corp. has now been authorized to negotiate disposal of the government-owned smelter in Texas City.

Appraised value of the Texas City plant has not been released; interested companies are invited to submit proposals to the Office of Tin, 811 Vermont Ave., NW, Washington, D.C.

More aid to companies devastated by last month's floods seems a possibility this week. Federal Civil Defense Chief Val Peterson, concerned about the legality of extending rapid tax write-off assistance to damaged plants not producing defense or defense-related products, is now casting about for other means of proffering help, seems confident of finding it.

Although U.S. producers have been rebuffed in previous attempts to gain a foothold in the Canadian aluminum business, one U.S. company now appears to be on the brink of success.

Reynolds Metals Co. is negotiating with Canadian Simard interests for control of Aluminum Rolling Mills (one of the largest producers of foil in Canada). Involved: a reported \$5 million.

Odds on succeeding: good.

Delhi-Taylor Oil Corp.—a Clint Murchison-connected firm—is also optimistic that its plans to engage in a multimillion-dollar potash mining and milling venture near Moab, Grand Canyon, Utah, will be realized.

The company is said to be considering association with a major chemical company. But no decision on this score has yet been reached.

The Borden Co. plunged deeper into chemicals this week with a new nitrogen fertilizer product called Borden's 38.

Touted as releasing nitrogen into the soil for periods ranging from 6 months to a year, the urea formaldehyde derivative is now being

sold in 50-lb. bags, next spring will be marketed in smaller packages for home use.

Somewhat less blissful tidings come from the industry's labor relations front:

• In Florida, where International Chemical Workers Union (AFL) is still on strike against two of the eight phosphate producers that were shut down three months ago, police were using bloodhounds in an attempt to nab the persons who dynamited the sulfuric acid unit in the strikebound International Minerals & Chemical plant near Mulberry. Plant Manager William Bellano says wrecking of the acid unit won't keep the company from trying to maintain limited production by use of supervisory personnel, and that the company still wants to negotiate "a fair and equitable settlement."

• In various other states, labor unions are putting more coolweather pep into their drives to organize chemical employees. AFL's International Union of Operating Engineers—with ambitious plans for itself in the industry—got a big lift from a National Labor Relations Board decision upholding its bargaining status at the Dow plant in Freeport, Tex.

And at Niagara Falls, N. Y., AFL's Office Employees Union is seeking bargaining rights for 600 office, clerical and technical employees of Carborundum Co.

Uncomfortably perched in the middle of a community row at Houston, Tex., are the chemical process companies along the Houston Ship Channel.

One chemical executive tearfully told county commissioners that Dr. Walter Quebedeaux of the county health unit has created "hysteria" by springing criminal suits on pollution. This executive charged that Quebedeaux had filed a criminal case against his firm two days after the company had agreed to permit county officials to conduct tests within the plant, and after the company had spent \$11 million on a process to cut contamination.

No injury to domestic nicotine sulfate producers, however, has been found by the Tariff Commission in its latest antidumping investigation.

U. S. producers had complained that a Dutch firm was "dumping" material here at less than fair value; the Tariff Commission says it can find no indication that such a case occurred.

A one-year contract providing for West German potash deliveries to Japan is in the final stages of negotiation this week.

Almost 18 million marks' worth of potash was exported from Germany to Japan in the first 6 months of 1955—a figure that can be expected to double if the current deal goes through.

Morocco, the world's second largest producer of phosphate rock, awoke from a weekend of rebellion a fortnight ago to find its principal installations at Khouribga knocked out of operation by sabotage.

In 1954, Morocco produced a record quantity of 5 million tons of phosphate rock; 3.4 million tons of this was turned out at Khouribga.

Damage to installations, however, is now so extensive that it's doubtful whether Khouribga will be able to ship any phosphate rock for at least 2 months. Reconstruction costs will run up to \$4 million.



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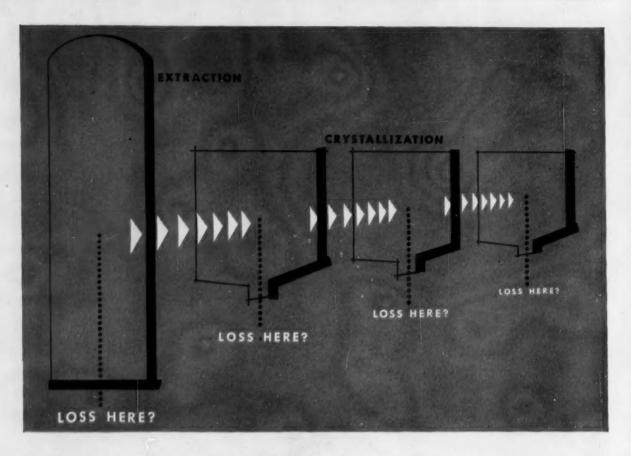
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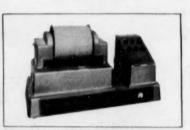
A large drug manufacturer had a complex, multistep process for refining a natural product into a finished pharmaceutical. Yield was only about 85%. Conventional analytical methods were unable to detect at what step or steps the 15% loss occurred.

By labeling the incoming raw material with deuterium - and checking at each step in the process with a P-E infrared spectrometer - the manufacturer was able to find exactly where the losses were taking place. Result - an estimated \$50,000 annual saving through increased process efficiency.

In research, in raw material analysis, in quality control, more and more manufacturers - small and large - are achieving big savings through infrared analysis. P-E has sold many more infrared spectrometers than any other instrument manufacturer - can give you more application help and more service. And P-E has the broadest infrared instrument line, with an instrument and an accessory for every problem.

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BUSINESS & INDUSTRY

LABOR BOARD'S LATEST RULINGS

Favorable to Management

- Employers are not required to admit union representatives to plant to study workers' jobs.
- An agreement to arbitrate disputes bars a union from striking even though the contract doesn't contain a no-strike clause.
- Unions can't demand payroll information from employers if they once abandon that demand during negotiations.

Favorable to Unions

- Employers can't insist on a contract calling for a secret ballot vote by workers before a strike can be called.
- Unions can't be penalized for unfair labor practices against their own staff employees, although same tactics are illegal for employers.

Favorable to Neither

NLRB won't handle jurisdictional disputes in construction industry.

Bosses' Rights Bolstered

More sympathetic on management problems in general than it was before 1953, but not quite understanding enough on chemical industry problems in particular—that's the way this industry would size up the National Labor Relations Board this week after its first two years under a Republican majority.

Now is a convenient time for taking stock of what the board has and hasn't done, because the board has just completed action on a batch of test cases that it was straining to decide before the resignation of its first GOP chairman—Guy Farmer—became effective last month.*

The flurry of late summer decisions—some of which are of considerable significance for chemical process companies—constitutes a series of new policy rulings for the guidance of management and labor. And some of these recent rulings—like many labor board decisions during the past two years—tend to modify or reverse policies that had been set by the Democrats.

Farmer declined reappointment to return to private law practice, and President Eisenhower has not yet named a successor. NLRB will operate as a four-man board under Acting Chairman Philip Ray Rodgers until a new candidate is chosen by the White House. Plant Privacy Upheld: Probably none of the latest decisions will turn out to be so meaningful in chemical industry labor relations as the board's opinion in the American Potash & Chemical case in 1954 (in which NLRB refused to make plantwide bargaining the officially preferred practice in chemical plants). But several new rulings will be welcomed by management as establishing rights that up to now were most uncertain.

NLRB continued its new emphasis on sanctity of an employer's plant by denying an employee bargaining group permission to enter a plant of Westinghouse Electric Corp. to make "on the spot" studies of members' job assignments. The board held that this should be resolved by collective bargaining, rather than by "administrative flat or judicial decree."

Although the board still feels that employers must furnish payroll records on demand if there's a question of ability to pay higher wages, it now has qualified this stand. After the American Newspaper Guild had abandoned its demand for financial data in certain negotiations, the board ruled, it could not later reinstate its request.

Clause Bars Strike: Another verdict that may serve some chemical employers in good stead came in the case of 20 AFL Teamster members who had been fired because they went out on strike. The board upheld the employer on the ground that the strike was barred by a contract clause providing that all grievances would go to arbitration.

One decision was a clear victory for labor unions; another was in favor of one union but against a union that was trying to organize the first union's employees. The board declined to hear a jurisdictional dispute between two AFL construction worker unions, leaving such matters to a joint contractor-union board. This might be able to settle such disputes faster than the NLRB; and if so, this plan would be better for chemical firms, whose expansion programs have often been delayed by interunion fights.

Site Searching

Resources Corp., a subsidiary of the National Farmers Union, is searching around in eastern Arkansas this week, site-hunting for its proposed multimillion-dollar fertilizer and farm chemicals plant.

The plant had been scheduled tentatively for construction in the vicinity of Georgiana, Ala., but a number of company officials held out for a more centrally located area—with more accessible water transportation facilities.

NFU President James G. Patton says that no decision will be made for at least 60 days, and that freight rates will be a large item in the final decision.

But NFU owns 15,000 acres of potash holdings near Carlsbad, N.M., and has entered into a partnership agreement with Kerr-McGee Oil Industries and Phillips Chemical Co. to mine and process potash for use in fertilizers to be distributed by Resources Corp. Thus, industry observers wouldn't be surprised if the search turns farther west before a decision's rendered.



UNDER NEW MANAGEMENT: Brownsville plant is ready to go, now that . . .

Refurbishing Is Over

After a year of concentrated effort—to get the Brownsville, Tex., plant it acquired from ill-fated Carthage Hydrocol in working condition—Stanolind Oil and Gas Co. is ready to venture a step-by-step start-up program.

Due to be placed in operation first: the utilities section of the gas synthesis plant, including electric power and steam.

The plant's oxygen unit, said to be one of the world's largest, will start testing out in September, with regular operation slated for late October.

Thereafter, company officials promise, other sections of the chemical operation will be put in working order according to their function in the operating process. (Total output, when all units are in operation will be 125 million lbs./year of chemicals from natural gas—mostly in the form of acids, alcohols, aldehydes and ketones.)

Chief Trouble Spots: What industry men will be watching closest is whether Stanolind (through The Lummus Co., prime contractor for the reconditioning program) will have been able to straighten out snags in the plant's gas generators and Fischer-Tropsch synthesis reactors.

These were the chief trouble spots into which Carthage Hydrocol floundered from the day the plant first opened in 1950 until the day it closed in June, '53.

Lummus has had 800 men working at Brownsville for the past year, says it now has the complete operation on a sound working basis, expects first products available for sale early in 1956.

Significant Import: Getting the Brownsville plant in good working order would be more than a feather in Stanolind's cap. Its prime interest in seeing the plant in operation, right from the start, has been a \$14-million plant next door, designed to process the stream of co-products flowing from the hydrocarbon synthesis operation.

That plant has been virtually idled since Carthage closed up shop.

If all goes well now, however, both plants could be pouring profits into Stanolind coffers by 1956.

NEXT WEEK

Dan Kurzman. Tokyo bureau chief, this week completed an exhaustive study of foreign penetration — by technical assistance and/or cold cash—of the Japanese chemical industry. Next week CW will publish this significant, provocative report on the current status of U.S.-Japanese cooperation.

Going, Going ... Up

Chemical companies, which have long viewed completion of the St. Lawrence Seaway as a means of decreasing shipping costs, were in for a bit of a blow this week. Freight rates are going up—and every company using the waterway will pay more of the Seaway's costs than had been originally anticipated.

The blow came in a ruling from the Bureau of the Budget (which acts for the President in such matters) stating that the St. Lawrence Development Corp. will be responsible for installing, operating and maintaining all navigation aids needed in the waterway project. (On all other waterways, in and around the U.S. shoreline, the Coast Guard handles this chore.)

All told, however, navigation equipment may run to a cost of several million dollars—an expense that will be borne by the shipper in higher freight tolls.

Reason for the Budget Bureau's decision is this: the Coast Guard, if it received jurisdiction for navigation aids, would have to go to Congress for funds to finance the project; the Seaway Corp. is expected to be able to handle installation out of its present authorization of \$105 million.

Wanted: \$1,000 Reward

Whether anyone has ever been hurt by drinking fluoridated water is the issue in a lawsuit pending this week at Chehalis, Wash., where the Chehalis Fluoridation League is continuing its campaign to have fluoridation adopted in that city.

The lawsuit is welcomed by league chairman Edgar Johnson, Chehalis dentist, as an opportunity to have fluoridation pros and cons discussed dispassionately in a court of law.

Filing the suit against the league was F. B. Exner, Seattle physician and radiologist, who has been a long-time foe of fluoridation. He's asking the Lewis County Superior Court to order the league to pay him the \$1,000 reward that had been offered before last May's election to anyone who could prove that fluorides in drinking water—in the ratio of one part per million—have caused any ill effect on anyone anywhere.

Exner's "proof"—displayed at a public meeting in Chehalis—included

slides showing data attributed to the U. S. Public Health Service on occurrence of mottled enamel on teeth in persons who had been drinking fluoridated water. He also told about persons from Colorado whose teeth had allegedly been affected by fluorides.

PHS—which has been advocating fluoridation for the past five years—asserts that there is no recorded instance of harm from fluoridation in the prescribed amounts.

Though the Chehalis Fluoridation League failed in its attempt to have fluoridation ratified by the townspeople, it's been successful in defending the constitutionality of fluoridation. That triumph came in a suit that was carried up to the U. S. Supreme Court.

Gain with a Gamble

More production at 100% capacity and with low-cost electrical power—that's the ticket for eight aluminum and chemical companies in the Pacific Northwest under a new class of supplementary contracts that have just been confirmed and approved by the Federal Power Commission.

These contracts—covering an initial period through 1959—involve a calculated risk for the process companies buying the power. They'll be allowed to buy "provisional energy" on an interruptible basis during the winter months, paying little more than 2 mills/kwh.; but then, if Bonneville Power Administration finds itself without enough water in its reservoirs to generate all the power required by its municipal and other "firm energy" customers, the process companies will have to do one of these two things:

 Cut back production and let the other customers take some of the "firm energy" that the process companies would otherwise get under their regular contracts.

• Deliver into the BPA power grid steam-generated energy that will cost the process companies more than 6 mills/kwh. (If a company chooses this course, it will get a refund on the cheap energy it had previously bought from BPA.)

Companies that have signed up for the supplementary power under these terms: Aluminum Co. of America, Union Carbide, Kaiser Aluminum & Chemical, Pacific Carbide & Alloys, Pacific Northwest Alloys, Pennsalt, Reynolds Metals, and Victor Chemical.

End to 'Guilt by Tradition'

Long convinced that they've been blamed for much more pollution than they're really responsible for, chemical process management men this week are cheered by two developments that may help to shield the industry from unwarranted criticism in the future.

One is a finding by scientists in Wisconsin that algae in lakes and rivers can cause big fish kills overnight—a happening that often has caused citizens to blame chemical process plants. It seems that algae—small plants that live in the water—give off oxygen during sunlight hours, then absorb oxygen at night. Testing by the Sulphite Pulp Manufacturers' Research League showed that this could cut the oxygen content of a stream from 3.05 parts per million at 6 p.m.—plenty high to support fish life—to a low of 0.4 ppm

by 6 a.m., a level that's too low for most desirable fish species.

The other development is an appeal to the California Superior Court by two oil firms and three other industrial concerns that had been convicted of smog violations. They contend that the smog law is unconstitutional because the method used to measure discharge of smoke and fumes is fallacious. It measures shading rather than opacity, they argue, and so the "40%" reading might actually vary from 0 to 100%, depending on such factors as amount of sunlight and position of the observer.

These findings—it's to be hoped—may help puncture some loose assumptions behind much misplaced indignation about industry's alleged role in air and water pollution.



Blimp-Borne Lab Snuffs L.A. Smog

THE U. S. NAVY has joined in the detective work to find out what smog is and where the contaminants come from. To Naval aviators, these flights into Los Angeles smogs count as regular training trips; but their blimps carry extra cargo—equipment to take samples of smog-laden air at six different

altitudes for chemical analysis. This sampling equipment—operated by scientists of the Air Pollution Foundation—may help determine to what extent oil and chemical processing plants contribute to bigcity smog. One thing found by the blimp-borne laboratory: that smog in not concentrated near the ground.

COMPANIES. . . .

St. Regis Paper Co. has acquired more than 95% of the outstanding capital stock of General Container Corp. (Cleveland) through an offer proffering 2% shares of St. Regis for each share of General.

General Container had sales in excess of \$23 million last year, had 134,656 shares of common outstanding, with no preferred stocks or bonds.

Sulphur, Inc. (Houston) has asked the Securities & Exchange Commission for authority to register 400,000 shares of 1¢ par common stock—to be offered for public sale on a "best efforts" basis.

Net proceeds of the sale would be used to pay \$55,000 for the company's Boling Dome sulfur lease plus exploration, drilling, and incidental corporate expenses.

Preliminary to construction of a \$60-million pulp mill at Juneau, Alaska, the Georgia-Pacific Alaska Co. has entered a successful bid with the U. S. Forest Service for 7½ billion board ft. of timber in the area.

Prior to July 1, 1958, the firm must show financial ability to build its pulp mill and carry out terms of the \$14.5million timber sale.

Phillips Petroleum Co. will call for redemption, on Sept. 30, all of its 3.70% convertible debentures, due in 1983. The debentures were originally issued on June 1, 1953, in the amount of \$162 million. But that total has been reduced to \$92 million today—almost entirely through conversion into common stock.

EXPANSION

Cement: For the third time this year. Lone Star Cement Corp. has launched a major expansion program.

This latest expansion (slated to cost \$35 million) will include construction of a 2-million-bbls./day plant at Lake Charles, La., and enlargement of current capacity at Hudson, N. Y., Dallas, and Houston, Tex.

Lone Star's planned expenditures for 1955 now total \$57 million, will add an annual 10.2 million bbls. of cement to the company's total capacity.

Vinyl Acetate: Carbide and Carbon Chemicals Co. plans to double its vinyl acetate producing capacity at Texas City, Tex., by fall, 1956.

Vinyl acetate is widely used as a monomer and comonomer in polyvinyl resins, demand for which has been rising rapidly of late.

Terpene Chemicals: Glidden Co. will increase its terpene chemicals production capacity at Jacksonville, Fla., by 25%. Cost: \$500,000.

Isophthalic Acid: Construction of Standard Oil Co. of California's \$7-million isophthalic acid plant at Richmond, Calif., is virtually completed.

First production is now scheduled for the last quarter of 1955; capacity: 50 million lbs./year.

Sulfur: Directors of Pan American Sulphur Co. have approved a 50% expansion of the company's Jaltipan, Mex., sulfur producing facilities.

The expansion program is scheduled

for completion within the next nine months; water capacity will be expanded to 5 million gal. daily.

Synthetic Rubber: The Phillips Chemical Co. will expand its synthetic rubber producing capacity at Borger, Tex., by 15%. Construction starts immediately; completion of the work is expected by Sept. '56.

Orlon: Du Pont Co. of Canada, Ltd., will build a new plant at Maitland, Ont., to make Orlon acrylic fiber.

Engineering work has already started, but cost estimates and date of completion are not yet available. According to Herbert Lank, president, Maitland was chosen as the site of Du Pont's new plant chiefly because the company has space and facilities available there (a 2-year-old nylon intermediates plant at Maitland, and an older nylon plant at nearby Kingston, Ont.).



Quick, When It Counts

WHEN STANDARD OIL Co. of Indiana's catalytic cracker at Whiting, Ind., exploded last week, company officials, within hours, displayed once again the concern executives today have for the public. Though 10% of the 1,600-acre plant was destroyed (loss: \$10 mil-

lion), Standard opened an office early the next morning inviting damage claims for personal injury or property damage. Twenty persons immediately filed claims in person; others made inquiries by phone; all noted Standard's exemplary speed of action.



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Reynolds Activated Alumina Removes 12,500 Gallons of Water Per Hour in **Operation of Supersonic Tunnel**

At Lewis Flight Propulsion Laboratory, Cleveland, the 10x10 foot Supersonic Tunnel above has a design capacity of 1,440,000 cfm. Low cost Reynolds Activated Alumina is used in six large beds totaling 25,000 square feet to reduce this volume of air to a dew point of -40° F. (Inlet conditions; 85° F dry bulb, 78° F wet bulb, 68° F dew point.) In some applications, Reynolds Activated Alumina will adsorb up to 22% of its weight. It can be regenerated repeatedly by heating with little loss of efficiency.

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Reynolds Activated Alumina Used in HF Alkylation at Texas City Refining

The use of Reynolds Activated Alumina at Toxas City Refining Inc. reflects the high autitability of this material for drying of hydrocarbon feeds in many processes such as HF alitylation.
Reynolds Activated Alumina in these processes provides elimination of silica migration, better fluoride removal and thorough drying of alkylate while in process.

REYNOLDS







LANDMARKS: Alkali plant (now Diamond's) since 1921, L-O-F window glass works (one of largest) since 1916. BETWEEN SPURTS:

Kanawha Valley Catches Its Breath

Now—after 37 years of chemical buildup, often at headlong pace—West Virginia's Kanawha River Valley seems to be easing into a relatively calm breathing spell.

Present capacity—greatly increased in recent years—is being used briskly, and major companies have already bought land for future expansion; but for the moment, this appears to be a time for consolidating past gains and incubating new schemes.

So good a chemical industry location that plant sites are being bought years in advance of any specific planning for using them—that's the 97-mile Kanawha River Valley in West Virginia, a 4-county area that already produces about 4% of the nation's total output of chemical products.

While nearly all of the valley's major chemical producers have been expanding their present plants over the past three years, at least four of the larger firms have purchased sites for possible future development. These

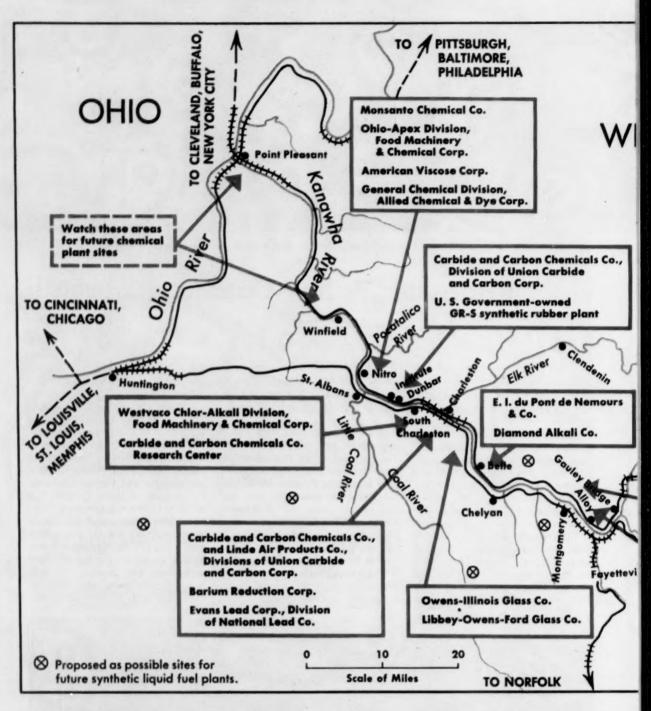
sites are all downstream from present industry centers (see map, p. 24). Du Pont has a tract fronting on the Kanawha near Henderson, across the river from Point Pleasant; Union Carbide owns two parcels of land, one near Buffalo and one at Eleanor; Diamond Alkali holds 1,800 acres at Eleanor; and Food Machinery has a site near Winfield.

Rich in Resources: That the Kanawha drainage basin can sustain these and still more large chemical plants for decades to come appears certain. Coal, natural gas, oil and water are plentiful, and there are untapped brine deposits downstream. Five hydroelectric plants (total installed capacity 140,240 kw.) are now in operation, and the Federal Power Commission calculates that nine additional stations could add 990,000 kw. new capacity.

New Horizons: Still another potential source of energy and chemicals: coal hydrogenation, yielding aromatic chemicals and other hydrocarbons; and coal gasification, yielding synthesis gas. Carbide and Carbon Chemicals Co. division of Union Carbide won the 1953 Chemical Engineering award for its achievements in hydrogenation at Institute; and now Du Pont's Belle Works has put into operation a new Bureau of Mines process of direct gasification. This process is already in use at two plants, and valley industrialists feel it may come into



NITROGEN, NYLON, POLYETHYLENE: At Belle since 1925, Du Pont turns out 120 products from coal, water, air.



general use for ammonia and other products if natural gas prices continue to rise.

One big coal producer is itself a branch of a chemical firm: Allied Chemical's Semet-Solvay division has here a large mine, coke and by-product ovens, and barge loading facilities that supply coal, coke and coal-tar chemicals to Allied plants along the Ohio River.

Salt, Gas, Oil: Thus fortified for the future, the valley's chemical process industry can exult in its present prosperity, reminisce about its enterprising past.

Groundwork for chemical industrialization started with operation of the region's first drilled salt brine well (1808), its first natural gas well (1815), and Kanawha County's first oil well (1911). First big chemical process plant in the valley was the government's smokeless powder plant at Nitro, built during the last year of World War I and operated for the Army by Hercules Powder Co. Much of this plant was taken over in the early 1920s by The Viscose Co., predecessor of American Viscose, and now—following a recently completed 50% expansion—is said to be the nation's

BUSINESS & INDUSTRY



SURROUNDED BY CARBIDE, Barium Reduction (white-topped buildings).

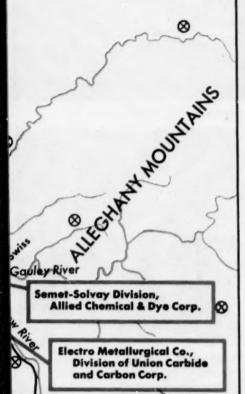


ON MAINLAND AND ISLAND, Carbide and Carbon-biggest in the valley.



AT BEND IN RIVER, Westvaco Chlor-Alkali plant dating back to 1905

ST VIRGINIA



largest staple fiber plant.

Union Carbide—now far and away the valley's largest employer—had been experimenting with hydrocarbons during and before World War I; and it moved into the area in 1920 by acquiring the Clendenin Gasoline Co. for a compressor station and natural gas supply. In 1925, Carbide and Carbon Chemicals leased a small plant in South Charleston to make ethylene

TO BALTIMORE, RICHMOND, NORFOLK Story begins on p. 23





IN LOWER VALLEY: Carbide at Institute, bulk chemicals and hydrogenation; American Viscose at Nitro, rayon,

glycol and other chemicals from natural gas. About five years later, Carbide's continuing growth established a beachhead on nearby Blaine Island; and today that plant is the largest chemical works in the state and one of the very largest in the nation.

Carbide also has a large plant across the river and a few miles downstream, at Institute. It was built during World War II to produce intermediates—especially butadiene—for the government's huge newly built synthetic rubber facility there. Since the end of that war, Carbide at Institute has been producing numerous chemicals for industry.

Alloys at Alloy: Still another Union Carbide activity in the valley is the Electro Metallurgical Co.'s works at Alloy. This plant—with its own hydroelectric power units—is believed to be the largest ferroalloy plant in the world.

Du Pont came to the Kanawha in 1925 through a subsidiary. Lazote, Inc., was organized to produce ammonia at Belle by the Georges Claude process, to which Du Pont had just acquired North American rights. After a corporate change in 1929, the plant became Du Pont's Belle Works.

This plant in 1932 began the first commercial production of urea in the U.S.; in 1937 it started turning out methyl methacrylate monomer; and from 1939 until 1947, this plant was the starting point for all nylon made

in the Western Hemisphere. A polyethylene unit was added during World War II.

Names Change, Plants Stay: Most of the valley's old-timers have undergone at least one change of name or ownership.

Westvaco got its present name in 1925, but its plant at South Charleston had been operating for the preceding decade under the name of Warner-Klipstein Chemical Co. And since then, this plant has branched out into magnesium silicate and numerous other products. Westvaco merged into the Food Machinery & Chemical family in 1948.

Barium Reduction dates back to 1914 when its predecessor, Rollins Chemical Co., went into business at South Charleston. Evans Lead began in 1922 as Evans-Wallower Lead Co., is now a division of National Lead.

Recharged by Merger: Two of the chemical plants that sprang up along the Kanawha in 1921 were those of the Rubber Service Laboratories at Nitro and of Belle Alkali Co. at Belle. The former—producing accelerators and other specialties for the rubber industry—was acquired by Monsanto in 1929, and has been much enlarged. Belle Alkali continued under that original name up to 1953, when it was acquired by Diamond Alkali.

Kavalco Products Co. began operations at Nitro in 1929; was renamed Ohio-Apex, Inc., in 1936; and since



MONSANTO AT NITRO: Predecessor's product line much extended.



FORMERLY KAVALCO: Also at Nitro, Ohio-Apex plasticizer works.

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1952 has been a division of Food Machinery & Chemical, specializing in plasticizers.

Acid Plant Newest: Newest basic chemical producer on the Kanawha is Allied's General Chemical Division, which opened a sulfuric acid plant at Nitro in 1948.

Process companies in the vicinity include the three big glassmakers south of Charleston; two producers of carbon black, both in Charleston; the big rayon plant at Nitro; and a number of small firms making paint and other specialties. One of the first of these smaller concerns was J. Q. Dickinson Salt Co., which is still doing business at Malden.

Just as those process companies are well located for proximity to suppliers of intermediates, so the Kanawha Valley's basic chemical producers are "sitting pretty" in their nearness to raw material sources. They are also favorably situated for the cheap water transportation and hydroelectric power afforded by the Kanawha and its tributaries. With these natural advantages, the Kanawha's chemical community appears to be in a strong position to capitalize on its researchers' continuing efforts to create new and broader markets for chemicals from coal, gas, oil, water and salt-all resources that the valley still has in abundance.

BIG JUMP IN JOBS

(Showing nearly 10-fold increase over 24-year period in employment in valley's major chemical process plants)

Company	1929	1953
American Viscose	300	1,352
Barium Reduction	140	330
Belle Alkali (now Diamond)	125	50
Carbide (South Charleston)	650	7,667
Carbide (Institute)	-	1,682
Du Pont	250	4,150
Electromet		2,137
Evans Lead	125	77
Monsanto (for- merly R.S.L.)	250	865
Ohio-Apex	-	375
Westvaco	250	1,305
	2,090	19,990

The man who changed his motto

There was once a chemical processor who was very proud of his purchasing motto, "The more it costs, the better it is!"
For many years this man invariably bought the most expensive raw materials.

Then one day he compared samples of ACINTOL® FA (Tall Oil Fatty Acids) with more costly oils he'd been using. This spot-check led him to try it in his own processes. What a pleasant surprise! ACINTOL FA rated "orchids" for quality everywhere he tried it.

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cific application relative to Lithium not indicated in the checklist, note the fact in the form furnished, attach it to your letterhead and send it to us. Our re-search laboratory will look into the matter for you.

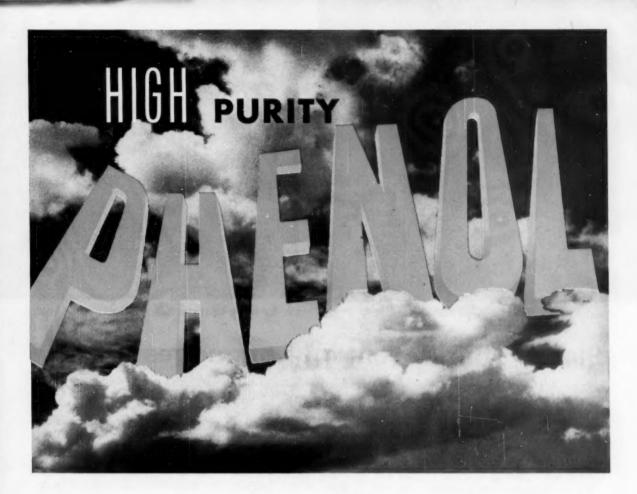
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(Compound, Metal or Derivative)
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BIENVENUE: Teachers get a warm reception.



COMO DICE USTED? Tutor demands Spanish replies.

Placing the Accent on Languages

Twice weekly—at two one-hour sittings—iwelve Rayonier executives are electing voluntary exile from English.

The self-expulsion begins when five Berlitz Language School instructors invade Rayonier offices to drill their linguist charges in French, Spanish, German and Japanese.

But for Rayonier, these companysponsored language classes are far from droll sport. On the contrary, the firm, by the simple expedient of having company representatives "talk the other man's language," is seeking to stimulate overseas trade.*

Discussing the Rayonier program, general sales manager Michael Brown says, "It's true we were doing fairly well in foreign countries with personnel who speak only English. But now we feel it's important that overseas representatives—especially technically

* Almost 40% of the company's chemical cellulose production now goes overseas. trained men-feel completely at ease in the customer's own tongue."

Problems, for example, that competely bog down in translation can be easily resolved by sending a technical man, versed in the language, to the customer's side immediately.

Still another prime reason for training home-office executives to speak foreign languages fluently: many of them will undoubtedly eventually assume responsible company foreignoffice posts. Why? In all but two posts abroad, Rayonier today employs only U.S. nationals. This practice, the firm believes, side-steps hot nationalistic differences that could spring up between non-U.S. businessmen.

Halfway Finished: Since Rayonier first launched its language school in April of this year, five different classes have reached the midpoint of a 60-hour course.

Practice sessions usually run from 8:30 to 9:30 two mornings weekly, are arranged at the convenience of executives and instructors alike. Choice of an early hour permits the class from being interrupted by office routine. But instructors also prefer meeting their language trainees early, they say. That's when trainees are freshest, most relaxed, and don't have a chance to "bone up" on tough language lessons too long before class begins.

Scheduling Tricky: As might be imagined, gearing classes to fit busy



SAVOIR-FAIRE: Gestures come naturally to Sales Dept.'s Maché (left).







TRES DIFFICILE: For Technical Service's Walton, French has its hurdles. Instructor helps him over trouble spots.

executive schedules can be a tricky business. Occasionally, because of unavoidable absences, Rayonier language trainees find it necessary to make up missed classes on Saturday.

And to do that they must go to one of the Berlitz schools in New Jersey, New York City or White Plains, N.Y.—at best a tedious chore.

An added incentive to a serious study approach: Berlitz posts the company with monthly progress reports on all its students.

Who Rates? Considering the attraction language training holds for the Rayonier executive who wants to "get ahead," how does the company decide who rates free tutoring?

Essentially, courses are proffered to a predetermined group. All of the men in today's classes are from the sales department—those most likely to come in contact with foreign clientele. The men have titles like general sales manager, technical service manager, domestic sales manager, export sales manager, and technical service representative.

Selectees are granted the privilege of picking the language they wish to study from any of those offered by the company. In most cases, Brown says, executives choose a language with which they're already familiar. Example: export man Dean Kutchera (Rayonier's only Japanese student) is credited with some knowlege of Japanese—picked up during service days.

Tab Small: What does a full-fledged language program cost a company each year? The tally varies,

of course, depending on how ambitious the project becomes. But here are some base figures:

- Rayonier is setting aside a budget of roughly \$2,500 for the sessions now under way.
- For 60 hours of instruction in each language, Berlitz charges about \$286 for a one-student class, \$210 each for two students; \$144 each for three students, and \$129 each for classes with four to six pupils.

Returns on Rayonier's investment, moreover, can't be estimated—they're too intangible. But dividends are already paying off. How? Many enrollees have already talked with customers in their own languages, find the business climate "completely changed" ... "infinitely more friendly."

As one barometer of how the idea is catching on elsewhere: Berlitz director Julio Vargas says, "Two years ago only one or two companies had contracted with us for this type of service. Now we have hundreds of firms all doing the same thing." For competitive-minded chemical outfits, that well may be a profit-promising cue.



company each year? The tally varies, PUZZLEMENT: Export Sales' Kutchera (left), instructor Choe trade Japanese.





CHILEAN NITRATE SHIPMENTS are down to 3.3% of world output, yet . . .

Producers Don't Despair

Production of Chilean nitrate, which at the turn of the century represented 65.8% of total world output, has today trickled down to a mere 3.3%. How did this displacement occur? and what steps will the government take to try to put Chile back in world markets?

These are questions of prime importance—not only to Chilean economists, but to U.S. competitors as well.

There's little doubt as to the quality of Chilean-produced nitrates. (They

sell on world markets for prices 10-20% above most competitors.)

But the industry has slumped into the depths of stagnation.

Why?

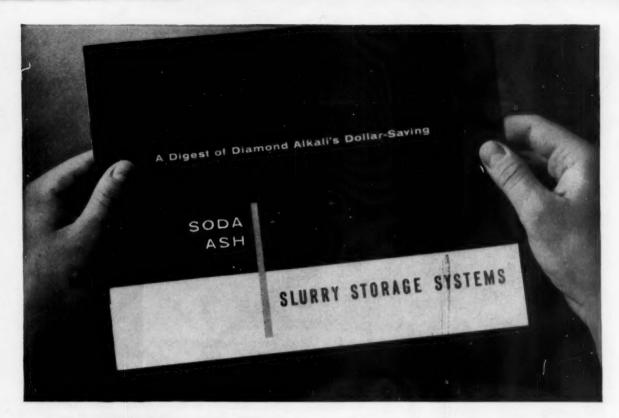
 Government policy toward nitrate producers has leached profits, robbed companies of needed expansion funds.

At present, all firms must sell to the government (at an exchange level far below their acquisition value) a certain percentage of all dollars earned

Chilean Nitrate Production Has Dwindled to a Mere Trickle of the World's Total Output

(tons, 000 omitted)

Year	Chilean Nitrate Production	World Nitrate Production	Chilean Production as a Percent of World Production
1901-02	1.272	1,932	65.8%
1906-07	1.747	2,833	61.7
1911-12	2,437	4,141	58.9
1916-17	2,715	5,894	46.1
1921-22	1,591	5,289	30.1
1926-27	1,812	8,582	21.1
1931-32	806	9,949	8.1
1936-37	1,562	17,407	9.0
1941-42	1,371		
1946-47	1.526	17,526	8.7
1951-52	1.446	33,574	4.3
1952-53	1,583	38,669	4.1
1953-54	1,430	42,874	3.3
1954-55	1,560	47,450	3.3



New, FREE booklet shows how soda ash users can cut storage space up to 60%

Do you use light soda ash as a solution in your processing operations? If you do, DIAMOND-developed slurry storage systems can save you money . . . in handling, installation, storage.

This new,16-page booklet from DIAMOND is loaded with facts, photos and full-page diagrams, showing the three alternate systems now used by many plants. These systems are based on a simple principle: Increase the bulk density of the material and store it in a readily usable form.

Slurry storage often requires 60% less space than is

taken by an equal weight of soda ash in dry form. Example: 58% light soda ash has a bulk density of about 35 lb./cu. ft. Storing it as a monohydrate increases the density to about 56 lb./cu. ft. That's a 60% gain in storage capacity. Look at the diagram.

The booklet is yours, free for the asking. Mail the coupon today. If you'd like information on soda ash or any other basic alkali products, call your nearby DIAMOND representative. Or write DIAMOND ALKALI COMPANY, Union Commerce Bldg., Cleveland 14, Ohio.

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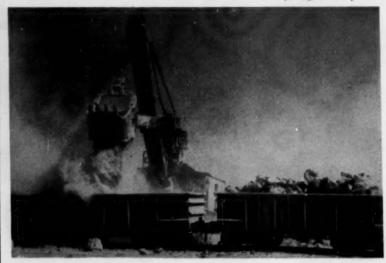
COMPANY....

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BUSINESS & INDUSTRY .

Story begins on p. 34



ONE FOR ALL: All Chilean nitrate is sold through one outlet—Corporación de Venta de Salitre y Yodo.

through export of nitrates.* This has increased costs, cut earnings.

• Severe inflation in Chile, and uncertainty caused by a fluctuating dollar exchange has prevented all but the wealthiest companies from making needed modernization equipment changes. (Some 35% of all natural nitrate produced today is turned out by the Shanks method in outdated plants that have been in operation for 40 years. Even in the case of the other 65%—produced by the Guggenheim method—300,000 tons of sodium nitrate and large quantities of potassium salts are lost yearly—through faulty production methods.)

 Chilean nitrate producers must compete—in export markets—with synthetic fertilizer producers, most of whom are protected by high tariff walls or import quotas.

Complete Breakdown Looms: In the face of such problems, the Chilean government, this summer, has finally recognized that complete breakdown of the home nitrate industry can be prevented only by a thorough reform of present legislation.

Thus it's placed a bill† before the Chilean legislature that, if passed, would give local producers, for the first time in many years, a chance to

* Producers include: Compania Salitrera Anglo Lautaro, Compania Salitrera Tarapaca y Antoraganta, Luis de Urticoechea, Compania Salitrera Iquique, and four other, much smaller, firms. † Would allow: a 10% amortization of investment in nitrate production equipment annually; exempt nitrate-producing equipment from import duties; base each company's earnings on real value, production costs.

get back in international competition.

If the bill is passed (and indications are it will be—sometime this fall), leading Chilean nitrate producers have pledged themselves to help in the rehabilitation effort. For example:

 Anglo-Lautaro would invest \$25 million in constructing additional solar evaporation facilities, modernizing railroad equipment.

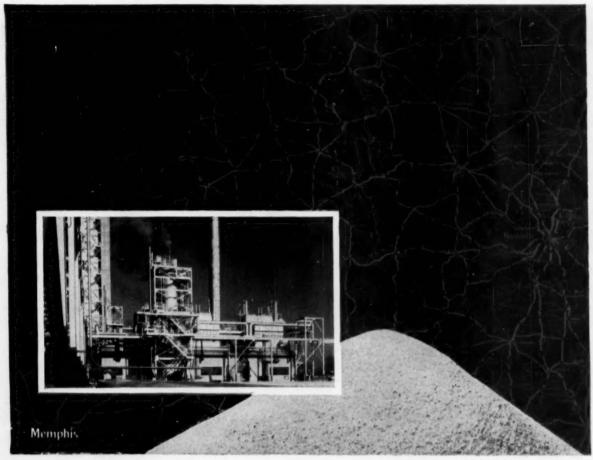
 Tarapacá has \$11 million specifically designated to construct a new power plant and double current nitrate production units.

Though the proposed law does not entirely satisfy Chilean nitrate manufacturers, it would adequately solve many of their more pressing problems.

And more important: it would give Chile a big boost toward economic stability.



LARGE RESERVES still exist in Tarapacá, near the Peruvian border.



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Crystal Urea

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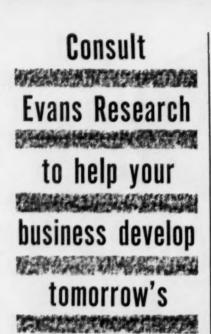
Illustrated are some of our modern facilities—typical of those used to produce Dewey and Almy's line of DAREX vinyl acetate polymer and copolymer emulsions.



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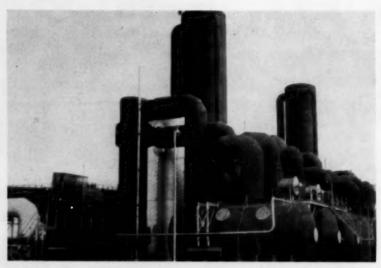
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SINDRI: Where pattern of foreign technical assistance is setting a precedent for India's proposed ammonium nitrate plant.

FOREIGN.

Fertilizer/India: The Indian Production Minister—apparently pleased with the recent progress at Sindri, India's government-owned fertilizer combine—has decided to go ahead with plans to build a 350,000-ton ammonium sulfate, ammonium nitrate plant in the Nangal area of East Punjab.

Not only are construction plans already completed, but also the government is speeding up plans to provide necessary electrical power, now scheduled to be available by early 1958.

Actual ground-breaking will take place sometime next year under the Central Public Works Dept., but, as in the case of Sindri, a foreign chemical engineering company will be asked to act as technical consultant.

Ammonia/Puerto Rico: Construction work will start this fall on an anhydrous ammonia plant at Guanica, Puerto Rico.

Capacity: 42,000 tons/year; owner: Gonzales Chemical Industries, Inc., San Juan.

Paper/Puerto Rico: W. R. Grace & Co. has reached an agreement with the Puerto Rico Land Authority whereby Grace will build a plant producing paper from sugar cane bagasse at Arecibo.

The agreement represents an \$8-million initial investment.

U.S.-Japanese Pact: Two large Japanese titanium producing companies (Osaka Titanium and Toho Titanium) have informally agreed to terms with a group of U.S. companies on sale to the latter of 2,000 tons of titanium under long-term contract.

Penicillin/India: Government of India, in another chemical expansion move last week. decided to up capacity at its newly opened penicillin plant at Pimpri by 60%/year.

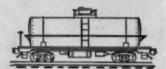
The decision is in line with a recent government directive to encourage development in India of easily-exported items—thus giving the country a more favorable dollar exchange position.

German-Greek Accord: Krupp interests will play a leading role in development of Greek lignite resources.

That's the word from Athens this week as final agreements are signed between Alfried Krupp von Bohlen und Halbach (representing Krupp) and Bodossakis Athanassiades, president of the S.A. Hellenique de Produits et Engrais Chimiques, of Athens.

Krupp will assist the Greek concern not only in exploiting substantial Greek lignite deposits, but also in helping to construct a low-temperature carbonizing plant—a major step in Greece's current industrialization effort.

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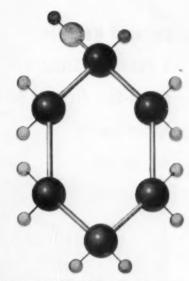
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*Partial Listing

MITAL: Degreasing agent; solvent in metal polishes.

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- ☐ Methane

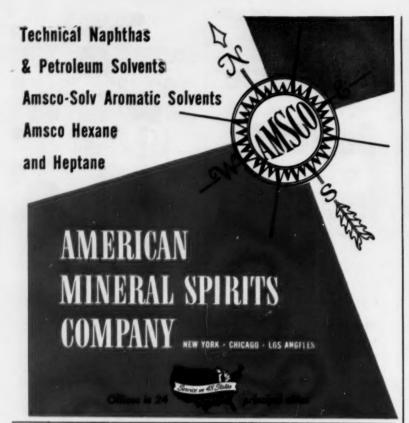
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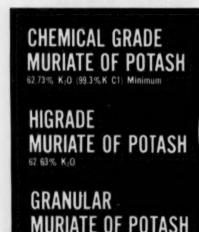
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LAWYER DEAN: In new U.S. law policy, his firm provides test case.

LEGAL. . . .

Inside and Outside: If your company has a run-in with the federal government, you may not be able to retain the law firm of your choice to represent you in the proceedings. This is because of the number of attorneys who get experience in government before going into private practice, and the Justice Dept.'s present policy relating to those lawyers. In an action against a group of oil companies, the Justice Dept. is asking the court to bar the law firm of Sullivan & Cromwell (New York) because one member of that firm formerly served in a federal office in Europe and might have "inside" knowledge that could be used against the government. Arthur Dean, senior member of the law firm, denied that Garfield Horn, the lawyer in question, had taken part in transactions on which the suit is based.

Shipment Seized: On New York's Staten Island, the U.S. government next week will try to auction 1 million lbs. of borax that was seized because it allegedly was about to be shipped to an "Iron Curtain" country. Denying this charge, the West German consignees brought suit opposing the confiscation. To avoid paying storage fees (\$1,000/month) during litigation, the U.S. will sell the borax, hold the money in escrow until the suit is settled.

Also seized: 500,000 tons of paraffin wax, but the Swiss consignee has permission to try to sell it.



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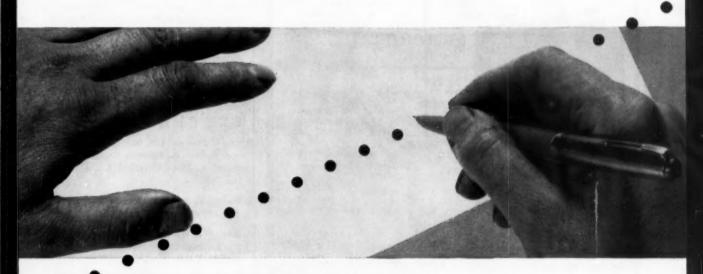
JUDGE PRITCHARD: On right-towork, no law-making by his court.

LABOR.

Union Shop Upheld: In Indiana, at least, a union shop contract seems to stand up in the courts. Vernon Smith, a nonunion employee of General Motors, had asked a state court at Indianapolis to keep GM from deducting union dues from his wages, as would be required under the company's new contract with the United Auto Workers (CIO). A GM attorney told the court the contract clause doesn't require employees to join the union, but it does require them to pay dues. Judge Walter Pritchard noted that the state legislature had thrice refused to pass bills for so-called "right to work" laws, and declared that "I have no right to make laws; that should be up to the legislature."

Labor Litigation: Other legal actions involving unions are under way North and South. At Trois Rivieres, Quebec, the Superior Court has granted an extension of its injunction against striking unions at Grand'mere and Shawinigan Falls; at Charleston, W. Va., a federal court has ordered the Oil, Chemical & Atomic Workers Union (CIO) to show cause why it shouldn't be enjoined from conducting a secondary boycott in Huntington; and in Washington, the National Labor Relations Board has refused to take jurisdiction in a case in which employees of a labor union had accused that union of unfairly keeping

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Whether you heat or cool water for make-up, process or any other use, you will need Wallace & Tiernan Chlorination to help combat slime problems introduced by waterborne bacteria or air-borne bacteria.

With slime control equipment designed for any need, built for lasting and dependable service, highly accurate and backed by over 40 years of successful application experience, Wallace & Tiernan Chlorination can help you increase the efficiency of your plant and cut operating costs. For further information write our Industrial Division.



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CD-39

employees from organizing.

And at Barberton, Ohio, where the independent Chemical & Alkali Workers Union has been on strike for more than two months against Columbia-Southern Chemical, Judge Frank Harvey found a union member guilty of contempt of court for having disobeyed a court order that permitted only "peaceful" picketing. Motion pictures—taken by the company and projected in court—showed that one striker had parked his auto across a plant entrance, thus keeping trucks from moving in and out.

Add to Labor Costs: Chemical process companies can expect the unions they deal with to refer in future negotiations to the United Mine Workers' new coal contracts providing a \$2/day wage increase. Another factor in rising labor costs: new state laws calling for higher taxes on employers for workmen's compensation and unemployment insurance programs. At least four states will levy higher rates for the latter cause, and 23 states are liberalizing their workmen's compensation benefit schedules.

KEY CHANGES. . .

Carl A. Gerstacker, to vice-president, and Robert B. Bennett, to assistant-treasurer, Dow Chemical Co. (Midland, Mich.).

Melvin F. Klub, to general manager, Rex Oil & Chemical Co. (Cleveland).

Noel V. Wood Jr., to supervisor, process engineering, Mobay Chemical Co. (St. Louis, Mo.).

Bruce F. Smith, to manager, technical service, Dow Corning Silicones, Ltd. (Toronto, Can.).

F. William DeBree, to general manager, sales, The American Plastics Corp. (New York).

Russell J. Rowlett, Jr., to assistant director, research, Virginia-Carolina Chemical Corp. (Richmond, Virginia).

J. E. Brinckerhoff, to manager, Refractories Division, The Babcock & Wilcox Co. (New York).

Homer Fry, to superintendent, production, Coal Chemicals Division, Pittsburgh Coke & Chemical Co. (Pittsburgh, Pa).

LOW-COST INTERMEDIATES IN TANK-CAR QUANTITIES

This versatile trio represents the most economical source of the amine group because of their low equivalent weights and moderate prices. Marketed by GSC in both anhydrous and aqueous forms, they are available for shipment in large-volume quantities (tank cars) as well as in drums and smaller containers. Write for latest Technical Data Sheet. Industrial Chemicals Sales Dept., Commercial Solvents Corporation, 260 Madison Avenue, New York 16, N. Y.

MONOMETHYLAMINE CH3 NH2

Uses

Manufacture of amide and sulfonated amide-type detergents and surfactants. Synthesis of caffeine, aminophylline and desoxyephedrine. Manufacture of photographic chemicals, the explosive tetryl, amide-type plasticizers, ion-exchange resins, corrosion inhibitors and paint removers.

Properties

Molecular Weight	31.06		
Beiling Point at 760mm, °C	-6.79		
Flash Point, Tag Open Cup, °F	34	(30%	sof)
Density at 20°C	0.912	(30%	sol)
Weight per U.S. Gallon at 68°F, lbs.	7.6	(30%	sol)

DIMETHYLAMINE (CH₃)₂ NH

Uses

Raw material in manufacture of thiuram sulfide-type vulcanization accelerators and of dimethyldithiocarbamic acid salts used as fungicides. Neutralizing and solubilizing agent in preparation of concentrated solutions of 2,4-D salts. Manufacture of anti-malarials.

Properties

Molecular Weight	45.08		
Boiling Point at 760mm, °C	6.88		
Flash Point, Tag Open Cup, °F	54	(25%	sol
Density at 20°C	0.921	(25%	sol
Weight per U.S. Gallon at 68°F, lbs.	7.7	(25%	sol)

TRIMETHYLAMINE (CH₃)₃ N

Uses

Preparation of long-chain quaternary ammonium compounds used as softeners, lubricants and waterproofing agents for textiles. Used with benzoyl peroxide to "set" methacrylate resins. Synthesis of cationic surface-active agents.

Properties

Molecular Weight	59.11		
loiling Point at 760mm, °C	2.87		
lash Point, Tag Open Cup, °F	38	(25%	sol)
Density at 20°C	0.913	(25%	sol)
Weight per U.S. Gallon at 68°F, lbs.	7.6	(25%	sol)







PHILLIPS' MILLS AND BENEDICT: Their data spotlights a new way of . . .

Cutting Deeper into Crude

Solvent fractionation is shaping up in research as a promising new process to boost output of cracking stocks.

Results of Phillips Petroleum studies point up the method's advantages over commercial vacuum flashing.

Until someone discovers an endless sea of high-grade catalytic cracking stock, gasoline makers will be seeking methods of recovering more of the same from petroleum crudes. Their task is daily becoming more urgent since reserves of high-quality, low-residue crudes are rapidly dwindling, need for high-octane gasoline is soaring while demand for residual fuels is on the decline.

Several techniques have emerged from research aimed at converting the residue into additional cracking stock. Deep-vacuum flashing is perhaps most significant among these, although coking and visbreaking are also useful.

This week, however, a highly promising new contender was shaping up in the form of solvent fractionation. In its favor are the findings of Phillips Petroleum researchers Paul Johnson, K. L. Mills, Jr., and B. C. Benedict, indicating that solvent-fractionated stocks should produce more gasoline and less carbon than those made by vacuum flashing. Laboratory cracking tests, run by the Phillips team, are said

to confirm this conclusion. And, by way of a bonus, the solvent process reportedly yields high-quality asphalts.

Briefly, solvent fractionation—as described by the Phillips group—is a technique utilizing low-molecular-weight liquid paraffins (propane, butane, etc.) to selectively precipitate asphaltenes, resins, aromatic hydrocarbons, catalyst-poisoning metals (nickel and vanadium) and other undesirables. Product is a light oil eminently suitable for catalytic cracking.

To explore the method—which is well known in lube oil technology but essentially new to gasoline production—the Phillips group set up a continuous countercurrent fractionation pilot unit consisting of a 25-ft. column, 3 in. in diameter; the column is fitted with staggered horizontal baffles (of 50% cross-sectional area) spaced 2 in. apart.

Operating variables are temperature and solvent-to-oil ratio. The apparatus is rated at 3.5-4 theoretical stages when using a combined oil-solvent rate of 12-16 gal./hour — the range used throughout the Phillips experiments.

Test feed stocks were long and short* reduced crudes produced from a western Kansas crude and West Texas-Panhandle crude.

Cracking tests of solvent-fractionated oils, produced under the conditions described above, bear out the method's effectiveness. Using fluidized confined-bed laboratory equipment developed by company researchers, the group found that the solvent-treated oils gave up to 54% less carbon than vacuum-flashed stock.

On the other hand, they yielded 5-7% additional gasoline and more light olefins suitable for alkylation and catalytic polymerization. Numerically, the boost in gasoline output is not very impressive; its real importance must be gauged in the light of the collective gain that might accrue from the use of adjunct processes (e.g., alkylation).

Scaling the results up to commercial proportions gives a more graphic idea of the potential of solvent fractionation. The heavy oils used in the laboratory cracking study would represent about 8-10% of the fresh feed to a cracking unit. Substitution of solvent-fractionated oil for vacuum-flashed oil in a 40,000-bbls./day unit would substantially reduce coke yield, permit the processing of nearly 5,000 bbls./day more fresh feed.

This, in turn, would result in an increase of 2,200 bbls./day of catalytic gasoline. And, if alkylation, is available, the total increase in gasoline output might easily come to 3,000 bbls./day. When the reduction in catalytic poisoning by metals is considered, even more cracking capacity is realized. There's always the possibility, moreover, that vanadium can be recovered, thereby rendering the process even more attractive. Right now, however, this is strictly conjecture.

Phillips is currently using liquid propane and sulfur dioxide to some extent in commercial refining operations. Texas Co. and others are also doing something with solvent processes. But one of the most conspicuous features of solvent fractionation is its long neglect in cracking-process studies. If the Phillips work is any indication, this state of affairs is not likely to continue.

^{*} A long reduced crude is the residue of atmospheric (or mild vacuum) distillation; short reduced crudes result from deep-vacuum flashing.



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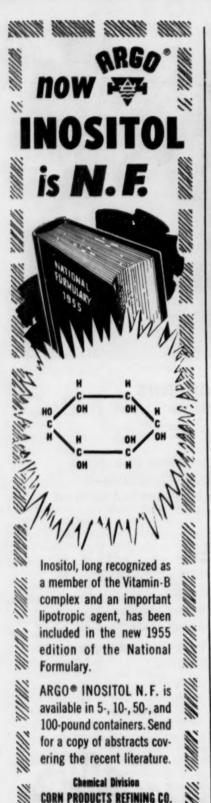
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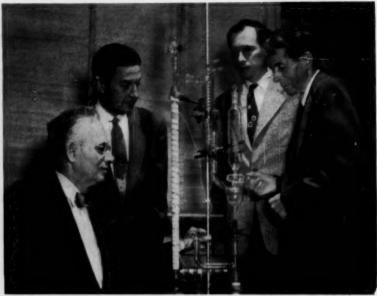
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REACTOR TEAM*: For laboratory syntheses, a bonus in speed.

Bench Reactor Pays Three Ways

Any device that can streamline laboratory- and pilot-production of new chemicals is sure to make research directors sit up and take notice. That's the reason for the high interest this week in a new continuous reactor built by Eastman Kodak (Rochester) chemists. The apparatus is said to speed laboratory syntheses, allow sizable laboratory production of organics at appreciable savings in cost, motion, and equipment over traditional batch techniques.

Already, the firm reports more than 20 inquiries into its ingenious and inexpensive (less than \$50) apparatus.

The continuous reactor is just what the name implies; it sustains a reaction so long as starting materials are introduced and end products are removed. Basic components of the device are a vertical tube filled with glass helices or Berl saddles; a means of supplying reactants at a controlled rate; and a receiver.

Devised by Kodak research laboratory staffers Charles Allen (assistant division head in charge of organic chemistry), John Byers, Jr., Wilbert Humphlett, and Delbert Reynolds, the apparatus is most effective with rapid reactions that result in almost quantitative yields.

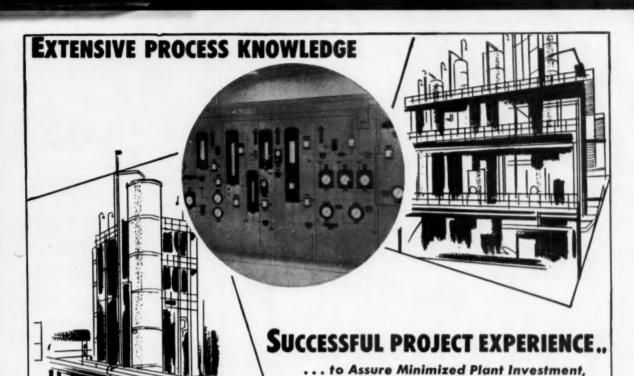
* L to r.: Allen, Reynolds, Humphlett, Byers.

Yields are generally lower than those obtained by step-wise techniques, (especially in slow reactions—e.g., esterifications). But the savings in time are compensation for this drawback.

Kodak chemists have used their invention to chlorinate xylenes, make isocyanates (via phosgene), alkyl bromides and cyanides, and for various hydrolyses. In preparing ethyl benzalmalonate, for example, they reportedly slice reaction time from 18 hours (batch) to 30 minutes, with only a 10% loss of yield.

Aside from its more obvious benefits, shorter reaction time can mean improvements in product quality. Palmitoyl chloride, made continuously, is light in color, high in purity. Reason: exposure to heat is cut from hours to less than five minutes, thereby minimizing degradation of the heat-sensitive product. Similarly, continuous side-chain chlorination of pxylene (using sulfuryl chloride and benzoyl peroxide) gives 4-xylyl chloride and 1,4-xylylene dichloride with none of the tar associated with batchwise reaction (or direct chlorination).

In slow-moving esterifications and brominations, it has been found necessary to collect and recirculate the effluent at least three times to obtain



ORGANIC CHEMICALS

Synthesis, recovery, and purification of methanol, ethanol, propanols, butanols; formaldehyde, acetaldehyde, furfural; acetane, methyl-ethyl ketane; formic acid, acetic acid; esters, ethers, glycols, phenols and hologen derivatives of oxygenated organic compounds.

PETRO-CHEMICALS

Production and refining of ethylene, ethylene oxide, ethylene glycol, ethanol and other ethylene derivatives; isopropanol and methyl-ethyl ketone; butadiane, benzene, heptane, toluene, styrene, diphenyl; and chlorinated hydrocarbons such as chloroethane, chlorobenzenes and chlorolouenes.

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Absorption, extraction and distillation processes for organic solvent recovery; sulfur dioxide recovery from sulfite pulp mill waste liquors and stack gases; organic vapor recovery from vent gases; recovery and refining of alcohols, aldehydes, acids and other chemicals from waste streams, fermentation and synthesis products and by-products.

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good yields. But even here, considerable time savings can be realized over batch processes. Case in point: synthesis of γ -chloropropyl acetate takes 2 hours for three passes (72% yield), takes over 9 hours (90% yield) by batch methods.

In addition to its forte as an economical laboratory production tool, the new reactor displays potential as an engineering aid (e.g., it has been used in evaluating catalysts). Because of this versatility, the apparatus should have little trouble finding employment in budget-sensitive new-product-development programs.

Tetracycline Booster: The yield of tetracycline from the organism Streptomyces aureofaciens is increased by the addition of sodium bromide to the fermentation medium. That's a con-



Save a Hand

SPARING hands from harm and minimizing glass tube breakage are functions of a new Central Scientific (Chicago) device for inserting glass tubing in rubber stoppers. Basic parts of the instrument, called Tube-On, are a plunger, adapter key (for angle tubing), and inserters. The latter contains thin flexible steel fingers that fit into the stopper hole. How it works: tubing, placed in the inserter, is pushed with the plunger, guided into the hole by the fingers. Cost: \$9 for three.



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HYPO-CHLORITE PRODUCTS

50% and 73% liquid; 76% solid, large and small flake, granular, ground, powdered. 8 and 10,000-gal. tank cars from Lake Charles, La. (also barges and tankers), Niagara Falls, N. Y., Saltville, Va., McIntosh, Huntsville and Anniston, Ala. Standard drums from Lake Charles, La., and Saltville, Va. 58% Na₂O: light and coarse light from Saltville, Va.; dense (standard and special) and SODA ASH light from Lake Charles, La. 100-lb. multi-walled paper bags and bulk carloads (also barges and ocean steamers from Lake Charles). BICARBONATE U.S.P. powdered and granular; miller's special; fine. 100-lb. moisture-proof paper bags from Saltville, Virginia. OF SODA Carbonic gas and dry ice. 20-lb. and 50-lb. net cylinders; 55-lb. blocks from 18 warehouses, Mathieson owned and operated. (Tank cars and tank trucks from Saltville, Va.). FUSED ALKALI Purite: 2-lb. soda ash pigs for foundry applications; PH-Plus: 1/2-lb. and 2-oz. soda ash cakes for water treatment. 100-lb. bags from Saltville, Va.; Purite also in bulk carloads. **PRODUCTS** Liquid. 16, 30 and 55-ton tank cars from Niagara Falls, N. Y., Huntsville and McIntosh, Ala., Saltville, Va., Arvida, Quebec. Multi-unit cars (15 one-ton units) from Niagara Falls, N. Y., and Huntsville, Ala. HYPOCHLORITE HTH: calcium hypochlorite (70% available chlorine) in granular and tablet form for water and sewage treatment; Lo-Bax: for dairy sanitation; plus a complete line of laundry PRODUCTS bleaches, 100-lb, drums and smaller units from Niagara Falls, N. Y. Textone: for textile processing; C2: for superbleaching of paper pulp; Technical: for water treatment and general use. 25-lb. pails and 100-lb. drums from Niagara Falls, N. Y. Also available as a 50% solution in 8,000-gal. tank car lots. Anhydrous: refrigeration grade (99.98%), commercial grade (99.5%): 26-ton tank cars AMMONIA from Lake Charles, La., Niagara Falls, N. Y., Morgantown, W. Va., Louisiana, Mo., and Marcus Hook, Pa. Aqua: 26° Bé. and U.S.P., 8,000-gal. tank cars, Niagara Falls. Hydrazine (N₂H₄), its hydrate solutions, salts, and organic derivatives. Liquids: 30 (240-lb.) HYDRAZINE and 55-gal. (440-lb.) drums; hydrazine salts: 200-lb. "Leverpak" drums and 20-lb. pails PRODUCTS from Lake Charles, La. Synthetic, prilled (not less than 99.5% sodium nitrate). 100-lb. multi-walled paper bags (palletized loading optional) and bulk cars (box or hopper) from Lake Charles, La. NITRIC ACID 60% HNO3. Tank cars and tank trucks from Lake Charles, La. 60° Bé. (77.67% H₂SO₄); 66° Bé. (93.19% H₂SO₄); 98%, 99% and 100%H₂SO₄; oleum SULPHURIC ACID 20% (104.5% H₂SO₄). Tank cars from Baltimore, Md. (also tank trucks, transports, barges), Little Rock, Ark., Bossier City, La., Beaumont, Port Arthur and Pasadena, Tex., Palmerton, Pa. Activated Alum Brand—designed for use in the field of water and sewage treatment. 100-lb. paper bags from Baltimore, Md.

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Engine coolant, industrial explosives, cellophane, hydraulic fluids, resins. Tank cars, compartmented cars, tank trucks, resin-lined drums from Brandenburg, Ky.

DIETHYLESS BLEEDL

Used as solvent, humectant, dehydrant and intermediate. Tank cars, compartmented cars, tank trucks and resin-lined drums from Brandenburg, Ky.

TRIETHYLENE GLYCOL

Used in gas dehydration, as a humectant and in production of emulsifiers, lubricants and polyesters; and as an air-sanitizing agent. Tank cars, compartmented cars, tank trucks and resin-lined drums from Brandenburg, Ky.

POLYETHYLENE GLYCOLS

Poly-G 200, 300, 400, 600; humectants and production of surface-active agents, cosmetics and pharmaceuticals. Tank cars, compartmented cars, tank trucks, resin-lined drums from Brandenburg, Ky.

POLY - SOLY'S (glycol ether selvents)

Solvents for dyestuffs, oils, waxes, resins; used in alkyd baking enamels, phenolic and epoxy coatings, cellulose and vinyl lacquers; in brake fluids, dry cleaning soaps, metal and glass cleaners. Tank cars, compartmented cars, tank truck's and drums from Brandenburg, Ky.

ETHYLENE DICHLORIDE

Extractant for alkaloids, vitamins, hormones; used in fumigants, cleansing agents, herbicides; solvent for cellulose esters, fats, waxes, resins. Tank cars, compartmented cars, tank trucks and drums from Brandenburg, Ky.

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ETHANOLAMINES

Mono-, di-, and triethanolamine. Preparation of surfactants for variety of applications and as absorbents in gas scrubbing. Tank cars, compartmented cars, tank trucks and drums from Brandenburg, Ky.

TRICHLOROBENZENE TECHNICAL

Manufacture of trichlorophenol and dye intermediates; as a heat transfer medium and in carbon cleaning and engine scavenging compounds. Tank cars and drums from Niagara Falls, N. Y.

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RESEARCH .

clusion of newly completed studies by Bristol Laboratories (Syracuse, N.Y.) researchers A. Gourevitch, M. Misiek, and J. Lein. Also noted: sodium chloride favors chlortetracycline output of the same organism. Normally, Streptomyces aureofaciens produces about two parts of chlortetracycline to each part of tetracycline.

Acid Entries: M. W. Kellogg is launching a series of new perhalogenated, monobasic carboxyl acids for use as emulsifiers in hot (up to 450 F). corrosive systems. Called Kel-F acids. they are derived from chlorotrifluoroethylene, have possible applications as metal-treating bath additives; insecticidal dispersants; gelling agents for printing inks, polishes, and lubricating greases; rubber accelerators, antioxidants and stabilizers; chemical intermediates; and promotors for twophase reactions.

Viscosity Gauge: For speedy determination of the kinematic viscosity of fuels, light oils, and noncorrosive figuids, Commercial Research Laboratories (Detroit) offers a new Type II viscometer. Features: readability within 1% of indicated viscosity at any point of the scale; ranges of 0.5 to 5.0 and 3.0-30 centistokes.

Corrosion Cabinet: Labline (Chicago) is making a new humidity cabinet for materials testing. It operates at 120 F, contains a revolving rack for 33 test panels.

DDT Synergists: Results of recent studies by Ernst Bergman and others in the scientific department of the Israeli Defense Ministry reportedly show that the insecticidal potency of DDT is greatly enhanced by diaryl-(trifluoromethyl)-carbinols. Di-(p-chlorophenyl)-trifluoromethylcarbinol gives a 25-fold increase in DDT activity in a 1:1 mixture. Prepared by reaction between ethyl trifluoroacetate and appropriate arylmagnesium bromides, the synergists have practically no insectidal activity, alone, although they are structurally analagous to DDT.

Pressure Drop: According to recently granted British Pat. 710.047 (to Ciba Ltd.), 1-hydrazinoisoquinoline and its salts, obtained from 1-haloisoquinoline and hydrazine, effect a prolonged reduction of blood pressure.

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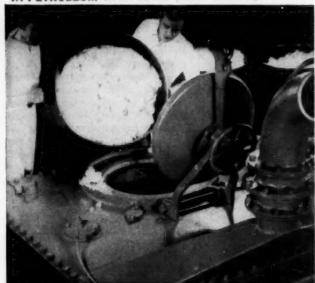
You'll learn about water, transportation, labor, taxes, raw materials, education, community character and atmosphere and many other data necessary for pleasant, profitable plant operation. Address your inquiry in confidence to Mr. Lee Davis, Manager Area Development, 30 Church Street, New York 8, New York.



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Rely on Enjay for top quality in your product, the kind that makes for growing demand and fast-paced selling. The Enjay Company supplies the petroleum, surface coating and chemical industries with a complete line of uniform, high quality petroleum chemicals backed by 35 years of proved results. You can also depend on Enjay for leadership in research and for expert technical assistance in developing new or improved products through chemistry. Next time, call Enjay for your chemical needs.



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Ethyl Ether isopropyl Ether Naphthenic Acids Iso-Octyl Aicohol Decyl Aicohol Decyl Aicohol

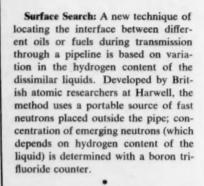
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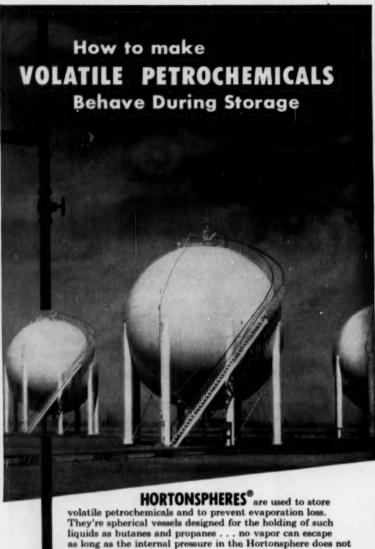


Research Meet: More than 600 executives are expected to participate in the American Management Assn.'s (New York) upcoming sessions on research management. The first combined large-scale conference and small-group seminar program to be conducted by AMA, it will deal with four subjects: research management: people and research; the research process; and controls and goals. The conference portion, scheduled for Oct. 6-7 at New York's Sheraton-Astor Hotel, will be followed by four sets of four seminars each, starting Nov. 3.

Safety Note: Newly released figures show the accident rate among civilian workers of the Army's Chemical Corps, including those engaged in studies of germ and radiological warfare, was less last year (for all causes) than for the whole Army. Civilian researchers also posted a better safety record than that turned in by the Chemical Corps. According to Army spokesmen, 104 civilian biological warfare researchers have been hospitalized since Jan. 1, 1950. Some of these were employed by private firms under Army contract.



You will find, in the new BUYERS' GUIDE, CHEMICAL WEEK's annual roundup of new chemicals and specialties introduced during the previous year.



as long as the internal pressure in the Hortonsphere does not exceed the pressure relief valve setting.

Shown above are some of the four 6,000-bbl. Hortonspheres built for Celanese Corporation of America at Pampa, Texas. Used for butane storage they have a working pressure of 75 lbs. per sq. in.

If you have trouble with storing volatile liquids, write our nearest office. CB&I engineers can help you.



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Igopons are important in many industries, including cosmetics, textiles, detergents, paper, leather, agricultural and industrial chemicals, to improve a product or process. In some cases, an Igopon is selected because of its high or low feaming characteristics, its unique dispersing or emulsifying qualities, or for its excellent detergency; in others, an Igopon is selected for its wetting power, chemical stability or physical properties.

So whether you're looking for a surfactant in an agricultural wettable powder, a base for laundering detergents, or a bubble bath formulation, check with us on the correct Igapon to use in your particular application.

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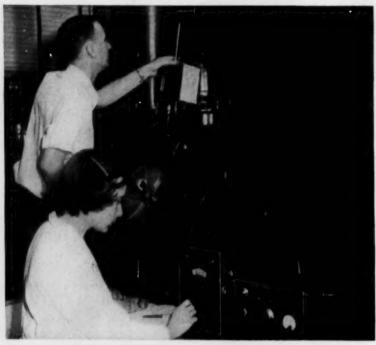
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SPECIALTIES



SOLVENT TRIAL: For drycleaners, the lab keeps tabs on solvent performance.

Cooperation for Guidance

Suppose you're a small businessman, probably not chemically trained, but absolutely dependent on specialty chemicals for your operation. How can you be sure the chemicals you buy are top quality? How can you keep abreast of the new specialties in your field?

If you're like 8,500 drycleaners in the U.S., its territories, and 40 foreign countries, you join with your fellow firms to create an association such as the National Institute of Drycleaners (Silver Spring, Md.), and keep a permanent staff of technically trained people to develop new techniques for you, to test products, to solve the individual problems that might arise in your business.

Just last month, for example, NID published a list of drycleaning solvents it had tested (see cut) and approved for association members' use. Coming up in the next few weeks is a recap on drycleaner-applied water repellents—a yearly service that includes checking of repellent application, and an evaluation of the processes' effectiveness.

Dual Service: Besides serving and

guiding the drycleaners, however, the institute has a function that pays off for the chemical specialties makers. It's a clearing house for new products and developments, provides a means of reaching influential cleaners. And the product lists are virtually buyers' guides.

There are certain specific services to specialties makers offered by NID. In its complete cleaning plant and laboratories in Silver Spring, a staff of nine chemists and five technicians conduct a variety of research, including:

• Fellowship programs, designed to determine—for the cleaning industry as well as the manufacturer — the merits of a material or a process. The manufacturer pays for such a study (which lasts at least a month); fees range from \$2,500 up, depending on time and personnel required. Though NID hopes to obtain material from these to be published in its monthly bulletins, the test results can be withheld by the sponsoring company. (Fellowship bulletins published by NID can't be used in advertisements.)

· Confidential tests on product or

processes, with results going only to the sponsor. Resultant data can be used as the maker chooses, although, again, NID cannot be quoted in ads or sales promotion. Minimum cost for this will likely run around \$875 for a full program; certain types of testing, charged on an hourly basis, could be less, and of course extra time and personnel could boost costs.

No Seal: While charging a fee for making these special tests, the institute checks solvents and water repellents without cost to the maker—NID simply requests enough material on which to run its tests.

Neither the fellowship products nor those approved by the institute in its annual surveys is given any special seal of acceptance or approval that the manufacturer can display.

Where NID rates processes or treatments (besides its list of water repellents it compiles an evaluation chart on drycleaner-applied mothproofing compounds), it code-numbers the products for its bulletin lists, provides the names only upon direct requests by letter from the individual drycleaners.

Safety First: NID has a third job besides testing new products and solving drycleaners' problems. It develops products and processes of its own. Indeed, one of its first big triumphs was the devising and adopting of a relatively fire-safe drycleaning solvent. This was Stoddard solvent, worked out by a group that included the then-president of the association, W. J. (Dixie) Stoddard.

Within the past half-dozen years, the industry has benefited greatly from another NID project—the use of solvents that contain about 4% synthetic detergent. This syndet, plus the very small amount (0.3%) of water carried in the solvent, removes considerable water-soluble soil (e.g., salt or perspiration), which could formerly be taken out only by "spotting" (e.g., individual garment treatment with a steam gun).

In its close association with the chemical industry, NID has gained in many ways. But on the other side of the coin, new synthetic fibers have caused plenty of headaches for drycleaners. Hard to wet, and sometimes softened by heat, the fibers, for all their advantages, have given the institute more than a small share of extra work.

Two CHEMICO - designed plants

produce over 900 tons per day of anhydrous ammonia for Lion Oil Company



Production volume at the El Dorado Chemical Plant reached an all time high in 1954. Total of all nitrogen products manufactured for sale increased 10 per cent over the previous year.

Anhydrous ammonia, which is the basic product of the plant and the raw material for the manufacture of other nitrogenous materials, was produced at an average rate of 582 tons per day throughout the year. The comparative figure for 1953 was 576 tons daily with the same equipment.

Extracts from the 1954
Annual Report of Lion
Oil Company, referring to
Plants designed by
Chemico to produce 900
tons per day of
anhydrous ammonia and
corresponding amounts
of nitric acid and
ammonium nitrate.

The Barton Plant near New Orleans, Louisiana, was completed in June, 1954, after a construction period of about 18 months. The manufacturing facilities were gradually brought up to full production and operated at rates above the designed daily capacities of 300 tons of anhydrous ammonia, 430 tons of nitric acid and 550 tons of pelleted ammonium nitrate. This plant was formally dedicated on October 25, 1954, in ceremonies attended by employees, their families and many guests.

CHEMICAL CONSTRUCTION CORPORATION

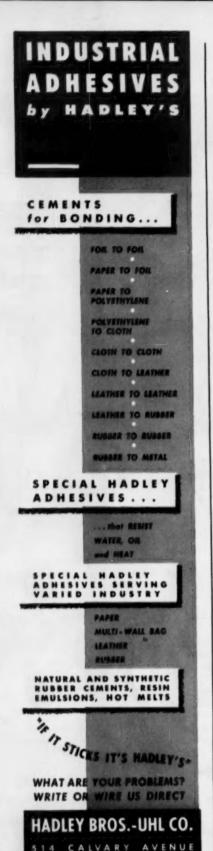
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SPECIALTIES . .

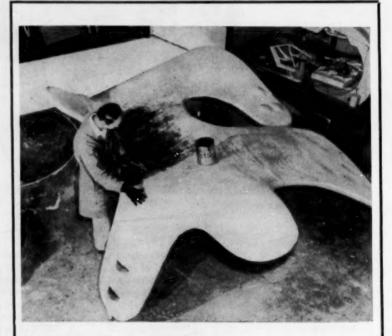
From the Tube

Where does new product inspiration come from? The idea for one specialty came from the Bracon tube (CW, July 3, '54), which seemed to cry to be filled with something new. The possibilities of Bradley Container Corp.'s (Maynard, Mass.) collapsible polyethylene tube caught the imagination of Stayner Corp., a Berkeley, Calif., pharmaceutical house, when it tried the tube for its Stay-Dee personal insecticide. This worked so well, the firm began looking for a new product that could use the container's advantages (low cost, good label-printing characteristics, light weight, durability, and adaptability to liquid, paste or powder) without running head-on into its chief disadvantage-permeability to various

Stayner's answer is a personal antiseptic called Merosol, custom-built to the Bracon tube (following Bradley's rule for success: "Balance the formula against polyethylene"). Promoted as stingless, stainless and nonsoiling, Merosol is a 0.1% aqueous solution of sodium ethylmercurothiosalicylate, with a wetting agent (0.1% monoethanolamine) and distilled water.

Vacation Defense: Though its market is limited to 11 Western states, Merosol sold 100,000 tubes during the first six weeks, largely to vacationers wanting to keep a first-aid item handy in the purse or glove compartment. A ½-oz. tube retails at 33¢ (but when the price was jacked up to 59¢ in some California resort areas, it still sold well).

Stayner reports that it is being flooded with airmail special delivery orders from wholesalers, estimates that sales will settle down to about a half-million tubes a year on the West Coast alone.



More Durable Whatsits

SHELL DEVELOPMENT CO. thinks it has found an ideal endurance test for its Epon resin. Above, it is being used in patching some new-type playground equipment—free-form "monsters," which children crawl under, climb over, slide about, and—as in the case of

this one from an Oakland, Calif., park—wear holes into. In a mood of experiment and public relations, Shell gave some Epon to the Oakland park, suggesting it be used on fiberglass patches. Shell figures if Epon stands up under kids, it will have a real talking point.

LOUIS 15, MISSOURI



Profit by Mr. Wedge's experience with our Ethers of Hydroquinones

Frank Wedge heads our Commercial Chemicals Development Department. His group assists manufacturers in the profitable application of our chemicals.

For the past 18 months, Frank has been working with our ethers of hydroquinones, D.M.B. and H.A., both in the field and in the laboratory. His experience with these intermediates is available for your use.

A careful review of the properties of these chemicals may suggest an answer to one of your product or processing problems. Address your correspondence directly to Frank Wedge, Ansul Chemical Company, Dept. C-12, Industrial Chemicals Division, Marinette, Wisconsin.

PROPERTIES	ANSUL ETHER-B.M.B. 1,4 Dimethoxy Benzene (Hydroquinone dimethyl ether) OCHs	ANSUL ETNER-N.A. Hydroxy Anisole (Hydroquinone monomethyl ether) OCH ₃	
Molecular weight	138.16	124.1	
Melting point	56.3°C.	52.5°C.	
Boiling point	213.0°C. @ 760 mm Hg.	246.0°C. @ 760 mm Hg.	
Density, g/1.	1.038 @ 55/55°C.	1.55 @ 20/20°C.	
Solubility in water in benzene in acetone in ethanol in ethyl acetate	@ 25°C. in grams/100 grams of solvent insoluble 177.0 233.0 33.3 150.0	@ 25°C. in grams/100 grams of solven 4.1 69.5 426.0 456.0 245.0	
Color and form	white to colorless flakes	coloriess, waxy flakes	
Odor	pleasant (sweet clover)	characteristic	



Fire! But this building didn't burn



Just before this photo was taken, this Butler building was wrapped in flames from an adjoining fire.

it's a fire-safe BUTLER steel building

Time and again, fire-safe Butler steel buildings have earned an unexpected bonus for their owners. In roaring infernos, they have shielded their contents -with only a few dollars worth of damage to easily replaceable covering panels. They have contained interior fires, leaving surrounding inflammable buildings untouched.

If fire strikes your present buildingsrebuild with Butler. Half finished at the factory-they are bolt-assembled in less than half the usual erection time. Besides being fire-safe, there are many more important Butler construction features that save you important money. Learn the whole story . . . send coupon today.



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SPECIALTIES



TIPON'S SCHEPPES: From a container idea, he put together a paint business.

Selling a Touch of Paint

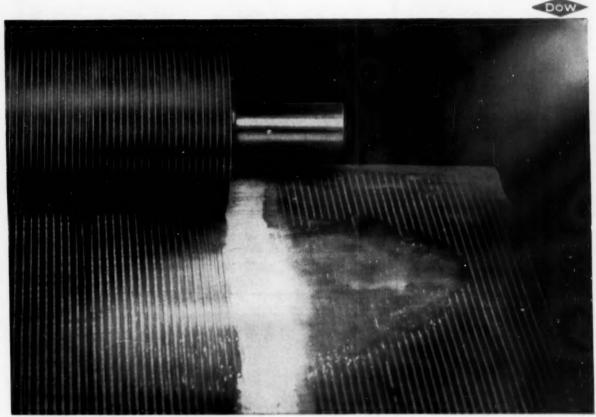
When the 1956 Lincolns go on sale Thursday (Sept. 8) there will be in each glove compartment a container of matching touch-up paint. This is the latest triumph of the Tipon Corp. (New York), a firm that has parlayed the modern trend to colorful living, a novel container idea, and smart marketing into a specialty business with 1954 sales of 4,050,000 units-at \$1/ package retail.

The age of three-tone automobiles and pastel refrigerators has complicated home maintenance with a lot of hard-to-match colors. Tipon's answer is to get the correct-color paint and put it into an easy-to-use fountainbrush applicator.

Tilt Down: The package-Tipon's patented flow-brush dispenser - is simple. The most common of its three forms is a three-inch aluminum tube with a convex plastic nozzle on one end. When the cap is removed and the dispenser is tipped nozzle-downward, a weighted nylon brush slides out loaded with paint (or whatever is being dispensed). Pressing down hard on the unit pushes the brush back in for a refill. The Tipon package also comes in a bottle instead of an aluminum tube, or with an applicator rod instead of a brush.

This package is Tipon's chief distinction, for other firms have been making matched retouches. Plasti-Kote, Inc. (Cleveland, O.) aerosolpacks lacquers and enamels colormatched to the products of Remington Rand, RCA Victor, several outboard motor makers. Dupli-Color Products Co., Inc. (Chicago) puts automotive and appliance colors (designated by make) into bottles, claims this is better than the flow-brush because lacquers are suspensions of as many as 9 pigments which settle at different rates, making exact color match difficult without stirring. In the business 15 years, Dupli-Color has sales of 6-7 million bottles a year, also sells 1 million units of furniture touch-ups ("Scratch-Master") in dispensers similar* to Tipon's.

• It is so similar, as a matter of fact, that Tipon is suing for infringement of its patent. Dupli-Color claims it had the fountsin brush idea several years before Tipon hit the market, that the Scratch-Master dispenser is different, having a spring-loaded brush ("can be used in any position") instead of Tipon's weighted gravity action.



"Hot set" adhesives made with Methocel (left) remain on the surface to be bonded—without Methocel (right) the hot adhesive penetrates the board.

HEAT GEL WITH METHOCEL KEEPS ADHESIVES IN PLACE

Superior synthetic gum gels when heated to keep adhesives from penetrating laminate materials

Methocel® (Dow methylcellulose) puts nature in reverse by gelling in heat, remaining viscous in cold. Even the temperature at which it gels may be determined by the viscosity type used—there are nine from which to choose.

The value of this unique Methocel characteristic in adhesives is obvious. Leather pasting formulations, "hot set" phenol-formaldehyde glues or any other adhesive used during hot pressing conditions need and use Methocel to advantage.

Even cold-setting glues use Methocel for dependable viscosity control. Colorless, odorless, inert and remarkably stable solutions of this gum are also widely used as a stabilizer, thickener, suspending agent, binder and film former.

For a free sample and assistance on your specific problem, write to the dow chemical company, Midland, Michigan, Dept. ME 328B1.



This hypothetical heat lamp set-up demonstrates what can happen to your glue line when heat is applied,

you can depend on <u>DOW CHEMICALS</u>



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of
Diglycol
Ethylene Glycol
Diethylene Glycol
Polyethylene Glycol
Propylene Glycol
Polyoxyethylene
Butoxyethyl
Glycerine



SPECIALTIES .

Juke Box Man: C. L. Hopkinson, Midwestern real estate, construction, and Wurlitzer juke box man, saw possibilities of the applicator several years ago, brought out a flow-brush full of white appliance paint. Quickly finding himself under a 7-month backlog of orders, he branched out with mahogany, walnut, blonde, maple, and black. Hopkinson still owns most of the stock in the closed corporation; N. C. Scheppes, president, owns the rest.

Tipon's retail line—these 6 items plus the more recent gold, night light, liquid solder, glue, rust remover, and monogram kit (a gold Tipon with a set of stencils)—accounts for 55% of the company's business. Of these, white and mahogany each sell twice as well as any of the others. These items

are sold through department, hardware, and variety stores (the variety stores insisted on a 49¢ line, but almost all retail sales are at \$1).

Fender Scratches: The other 45% of Tipon's business is in industrial sales—color matches for specific makes of automobiles and appliances. Companies like General Motors, Ford, Kelvinator, Norge, Hunter Douglas (venetian blinds) buy Tipons filled (usually) from the same stock as the original paint (thickened for brushability), distribute them through their dealers.**

Foreign subsidiaries, which manu-

** When this source of supply is unavailable, Tipon makes its own. Explains industrial sales manager Samuel S. Smith: "When you order a special color from a paint company you have to take a drum—we seldom use that much of any one color."



UNITED PRESS

It's the Heat

WHEN IT'S HOT ENOUGH for a pig to get sunburned, it's hot enough for people to do things like this. The piglet, a little Chester White turned pink, is getting a rubdown with two brands of sun lotion, will get a lanolin and glycerine mixture for good measure. A new market? Perhaps—if all pig owners were as conscientious as these employees of Chicago's Brookfield Zoo. Chances are, though, that most pigs will stick to the tried and true thick layer of mud.

STEPAN

AMIDES



LIPA

A 100% active, fatty acid alkylolamide, nonionic in

character. It is a light ivory color, waxy solid, with a mild, pleasant odor. LIPA is a superb foam stabilizer and also a good auxiliary detergent when used with fatty alcohol sulfates and/or alkyl aryl sulfonates. It is recommended for use in heavy duty laundry detergents, creme shampoos, rug shampoos and detergent hand cleaners.



LDA

A special 100% active fatty acid alkylolamide (a

diethanolamide condensate with a very pure grade lauric acid). It is nonionic in character. LDA is a splendid foam stabilizer for liquid dishwashing detergents. It is also an excellent wetting, foaming and thickening agent as well as a good detergent and emulsifier. Recommended too, for shampoos, hand cleaners, and for use in hard surface cleaners.



T6-A T6-B

Both products are alkanolamides,

100% active and nonionic in character. T6-A is recommended for use in bubble bath preparations for its fine foam stabilizing in the presence of soap. T6-B is recommended for use in clear and lotion type shampoos as a good thickening agent and auxiliary detergent with some emollient action.



HDA-7

A heavy duty alkanolamide with a built-in coupling agent which permits a very

high phosphate tolerance (as much as 11% on an anhydrous basis). Here is the product to investigate if you are looking for a heavy duty all-purpose hard surface cleaner with a lot of punch. Does an excellent job of wax stripping without harmful effect on floor.



ADI

A low sudsing, special, 100% active fatty acid alkanolamide. It is nonionic in character. ADT is highly recommended for use in formulating liquid scrub soaps. Among its advantages, it can eliminate the use of a coupling agent, has high viscosity and performs unusually well in hard water.



5-86

A 100% active alkanolamide.

Essentially nonionic in character with good alkaline stability. Specially recommended for use in textile scouring, dye leveling and similar applications. S-86 provides good detergency for both cotton and wool. S-86, in addition, also offers some advantages for use as a stabilizer and thickener.

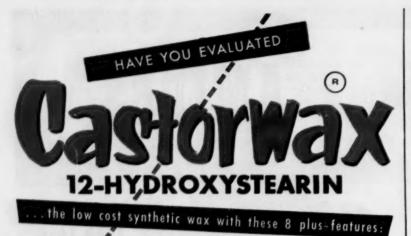
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SPECIALTIES . .

facture and fill the containers in England and Italy, work their industrial sales on the same pattern. (Although Lincoln is the first U.S. manufacturer to include Tipons with the car, Hillman, Talbot, and some other English makers have been doing it for several years.) Helena Rubenstein of Great Britain buys the containers to pack nail polish.

Retouch Hair: Nail polish is also sold in flow-brush dispensers in the U.S.—by Tipon licensee Fabron, Inc. (Waterbury, Conn.). This is Tipon's third area of activity—selling containers to pharmaceutical and other specialty makers for filling. (Tipon avoids doing the filling, particularly of pharmaceuticals, because of the controls which would have to be introduced.) Among the products so packaged; athlete's foot remedy, antiseptics, corn removers, hair-dye touch-ups.

Tipon has set up a research department to ferret out more specialty uses for the flow-brush, plans to grow in the strictly container supply field. But it also plans growth in its other two lines—with gimmicks like the monogram kit in retail, and by standing ready to catch other industrial plungers into color. Most recent example: Tipon is now working on matches for Emerson Radio and Phonograph Corp. (New York), due soon to come out with a line of pastel television sets.

Beer Bottle Soaker: Aluminum foil labels, much used on beer and other beverage bottles, have created something of a problem in washing returned empties. Particles of the pigments used to print the labels form specks on the bottles that defy rinsing. Tanatex Corp. (Kearny, N.J.) has what it thinks is a remedy-a new soaker-alkali additive called Merse, which imparts (the company surmises) similar electric charges to all solids present, forming a stable dispersion of pigment particles and other soil. The treatment, says the company, is more effective than presently used nonionic wetting agents.

Heatless for Tubeless: A self-vulcanizing cold patch for tubeless tires is now being marketed by Firestone Tire and Rubber Co. (Akron, O.). Without the use of heat or curing equipment, injuries of up to \%6 in. can be repaired permanently on all tubeless tires except those containing puncture sealant.

TOXAPHENE SCORES AGAIN!



Still number one insect enemy, the boll weevil returned to cotton fields this year with a vengeance. Hot, wet weather complicated the problem of boll weevil control. In many areas, damaging infestations built up rapidly.



Still number one boll weevil insecticide, toxaphene applied at regular recommended dosages controlled weevils quickly and thoroughly. Farmers who used toxaphene dusts or spray materials reported excellent control, prospects for a record cotton yield.

TOXAPHENE dusts · sprays

THE CHEMICAL BASE FOR TOXAPHENE IS PRODUCED BY HERCULES FROM THE SOUTHERN PINE

For the first time in several seasons the Cotton Belt is experiencing a major outbreak of boll weevils. Late summer rains and high temperatures are ideal conditions for cotton production, but also provide a perfect climate for boll weevils.

With populations increasing rapidly, and with a bollworm outbreak threatening, experienced cotton farmers turned to toxaphene, both in dusts and spray formulations. Toxaphene, the insecticide that won acclaim as the outstanding boll weevil killer during the last major weevil infestation, is again proving its value. Results with toxaphene have been excellent. Farmers didn't have to double their dosages. Toxaphene did the job at the regular recommended rates.

Agricultural Chemicals Division, Naval Stores Department

HERCULES POWDER COMPANY

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NX55-15



stored in **GRAVER** underground tanks

There was a time when Graver built tanks for storage of crude. That was 96 years ago when oil was first discovered. Graver still builds tanks for crude storage—and also for storing gasoline, kerosene, LP-gas and many other volatile liquids. Just recently Graver precision-fabricated a flock of large underground tanks for jet fuel storage. They will withstand a working pressure of 60 psi.

Whatever your storage problems, call on us. We have undoubtedly solved similar ones before.



CLASSIFIED! Pictured is one of 35 tanks which will be buried in the ground at an undisclosed site. Each tank holds in excess of 50,000 gallons.

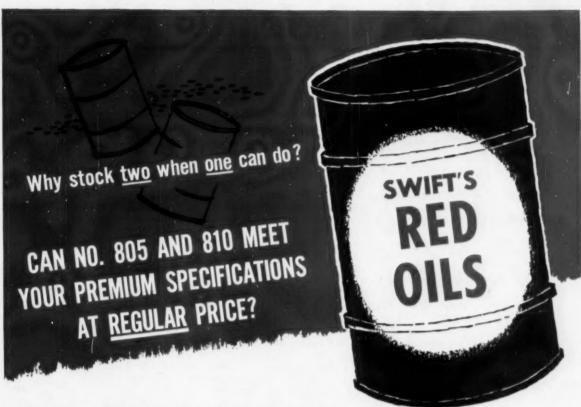


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Many of our customers have realized a savings of up to $2\frac{1}{2}$ ¢ per pound with Swift's Red Oil #805 (5 max. titer) or #810 (8-10 titer) over the premium grades they formerly used.

With a new process called Solexol, Swift & Company is able to produce a regular grade of red oil which will match many of the color and stability specifications laid down for the premium priced double distilled product. A low temperature decolorizing process, Solexol works at a temperature far below that of vacuum distillation, to give Swift's products the advantage of really effective decolorization—

How good is the color? One of our customers stopped using #805 because it was too light . . . his customer believed that his formula had been changed.

On some applications nothing can replace a highly distilled Oleic Acid, but if you're stocking two grades of red oil or using premium grade only 'because you haven't found a regular grade to match your specs . . . don't stock two when one may do! Write for details on a trial sample of Swift's Red Oil and remember . . .

ONE TRIAL IS BETTER
THAN A THOUSAND CLAIMS



WRITE FOR RED OIL BULLETIN

... describing all of Swift's Red Oil Products... including Oleic Acid #905, an extremely clear, distilled, fractionated fatty acid of exceptional clarity and color stability.

Oleic Acid (Red Oils) * Animal Fatty Acids * Sperm Oils * Vegetable Fatty Acids * Hydrogenated Fatty Acids * Stearic Acids * Neatex (Swift's Neat's-feet Oils) * Larex (Swift's Lard Oils) * Palmex (for Steel Mills) * Spermaceti U.S.P. * Textile Processing Oils * Monoglycerides * Sulfonated Oils * Anti-Feem Agents * Glycerine * Tallows * Hydrogenated Glycerides.

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	Swift & Company, Industrial Oil Dept. 1840 165th Street Hammond, Indiana	0-19
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	8-page bulletin on all of Swift's Oi	il Products.
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This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

PLURONICS IMPROVE LATEX PAINTS

Manufacturers of latex paints report growing interest in the Pluronics* -- Wyandotte's unique series of nonionic surface-active agents. Already established in a variety of latex-paint applications, the Pluronics offer paint makers a wide range of desirable properties to meet the specifications of many different formulations.

In many cases -- because of the combination of properties offered by each Pluronic grade -- a single Pluronic can be used to perform several functions . . . permitting formula simplification, and control of over-all properties.

For example: The Pluronics are 100% active in all forms -- including liquid, paste, and flake. The Pluronics are nonhydrolyzable nonionic surfactants . . inherently low foaming . . . practically nonhygroscopic . . . compatible and effective in a wide range of acid and base pH systems.

To date, the Pluronics are finding use in latex paints as wetting agents, dispersing agents for pigments and extenders, emulsifiers. Of the Pluronic grades commercially available, Pluronic L62 (liquid) and F68 (flake) have proved especially effective . . not only providing better brushability for medium— and heavybodied paints, but giving dispersing properties which help to maintain characteristic pigment shades.

Pluronic F68 is particularly effective in paints in which an emulsified oil phase replaces part of the latex. F68 in these systems aids in emulsification, and helps to prevent migration of pigments from the aqueous to the oil phase. In addition, Pluronic F68 -- available as either flake or powder -- may be used in drygrinding of pigments . . . aiding in preparation of finer grinds, and helping to prevent agglomeration of pigment particles on addition to aqueous systems.

Do these properties of the Pluronics -- so important to paints -- suggest other important applications to you? We'd be very happy to have our Product Development Department consult with you on your problems. Write us, discussing your problem or ideas in as much detail as possible.

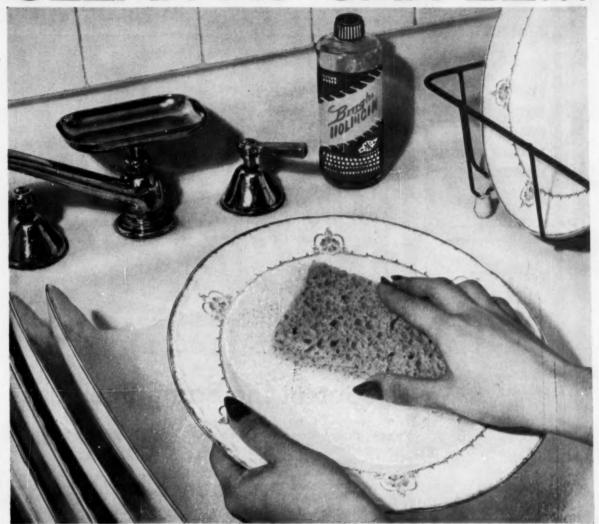
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WITH TRITON X-100

Dishes, glassware, cutlery, silverware, pots and pans—all of them come from the sink extra clean and sparkling bright when the high foam, high detergency of Triton X-100 is put to use in liquid household detergents.

How TRITON X-100 Improves Cleansing. TRITON X-100 is not only highly effective in removing soil, but also in keeping removed soil from being redeposited. It further increases cleansing efficiency by emulsifying oil and grease. Because it's a non-ionic surfactant, the detergent activity of TRITON X-100 is unaffected by hard water. Versatile TRITON X-100 promotes thorough cleansing of all surfaces—from plastics, rubber, glass, china, and pottery to silver, copper, aluminum, iron, and stainless steel.

Liquid household detergents clean many things around a home. While their principal use is in the kitchen, the housewife may expect her liquid detergent to clean floors, walls, windows, appliances and other surfaces. In all these applications high detergency ratings and high foaming are important. To give your product these properties include Triron X-100 in your formulation.

For samples of Triton X-100, formulation suggestions, or additional data, see your Rohm & Haas representative or write today to the address below.

TRITON is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.



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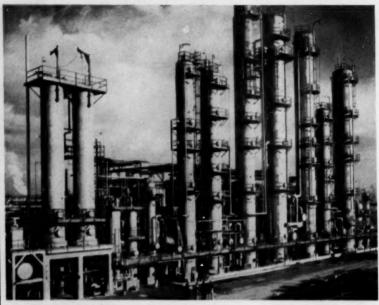
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Chemicals inc.

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SALESMAN'S TARGET: Many will be the salesmen calling on this refinery; few will make a sale. Must both the distributor and his principal . . .

Contest the Same Business?

"We have to fight for every drum we sell now. A couple of years ago it was different—like it always was. Then manufacturers never bothered about less-carload-lot (l.c.l.) orders. They left that to us. Now, they're grabbing everything they can."

With those words, one leading distributor voiced the changes that today's breathless competition is making.

Hard-pressed by tough competition, chemical companies are pushing into the l.c.l. markets—once the domain of the local distributor. And, in so doing, an old conflict flares up.

For not only is the jobber now faced with tougher competition, but more often he is competing with salesmen from the same company he represents. Such a situation, while not overly frequent, can pose nasty problems:

• For the dealer. Biggest headache issues from the fact that the dealer's sales, hence his income, are trimmed. But his relationships with the buyer and the purchasing agent suffer, too.

• For the supplier. Dealer-principal competition often engenders serious ill feelings. Duplication of effort (jobbers usually get all of the supplier's technical services, sales aids, etc.) also

results. Principals occasionally find that competing with their dealers means price shaving, since dealers often survive by this practice.

• For the purchaser. Because of yeoman service in past hours of need, dealers sometimes have firm relations with local companies. Buyers don't like to jettison the distributor and may, as a result, split orders between the dealer and the company. This satisfies nobody. The supplier and the distributor lose profits; the purchasing agent has a delicate buying problem as well as more bookkeeping.

Solution? Checking into how manufacturers met this problem, CW found no uniform approach. Some companies take a "let the best man win" slant. Others take c.l. and larger orders for themselves, relegate l.c.l. sales to the dealer. Some don't operate at all in territories assigned to dealers: others seek dealer-aid programs.

The "let the best man win" policy appears surprisingly well established. Here, no effort at all is made to apportion customers, territories, orders grouped by size, etc. Each sales force sells whatever it can. This policy, however, usually involves a clear under-

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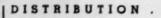


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Cyanamid leads the field in these Surface Active Agents...their production and application. Put this background to work for you. Send for our booklet discussing the various grades of Aerosol Surface Active Agents and their many profitable uses.





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If you're a chemist...chemical engineer...production man...executive—there's no better, no easier way for you to keep up with today's developments than by taking time out to visit this important exposition! Over 500 informative exhibits throw the spotlight on the new facts, ideas, materials and methods that you must have at your fingertips.

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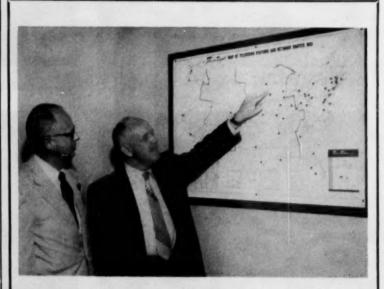
standing with the dealer at the outset of his contract that supplier salesmen can operate freely in his area. When the dealer gripes, he gets a "you were warned" answer.

Dividing sales on the basis of order size represents the solution of another group of producers. Generally the dealer sells to l.c.l. customers, and the producer covers the c.l. or large-volume consumers. When, as sometimes happens, a distributor's l.c.l. customer grows into a big-time buyer, some companies let the dealer keep the client. However, most large consumers prefer to deal directly with the producer. Occasionally, dealers get a small percentage "override" for all chemicals sold in c.l. lots in their area.

Exclusive territory arrangements for dealers are not widely used. In practice, however, most firms try not to set up stiff competition between dealers. And the natural radius of operation establishes a "practical" territory. Some concerns will not send salesmen into jobber territory. Curiously, independent sales agents generally have exclusive arrangements.

Occasional conflicts to the contrary, producers realize that distributor prosperity boosts producer prosperity. And many firms are actively pushing dealer-aid programs. Most recent activity: assignment of field men to work exclusively with dealers or agents in a certain territory. The field man (more a technical service representative rather than a salesman) does all he can to help the dealer sell. Salesman training for dealers, full supplies of sales-aids mark other attempts.

Mainly, these programs were instituted to prod dealer selling; but active interest by the supplier does have its soothing effects, too.



Medics Jam the Airwaves

MEDICAL THEMES have few equals when it comes to holding an audience's interest. Well satisfied with the success of its 15-minute, 13-week series last year, Ciba Pharmaceutical Products, Inc. (Summit, N.J.) will next week launch a much-expanded program. Scheduled for a half-hour, minimum of 26 weeks' run, the show, Medical Horizons, will beam out at a time near Dow's Medic.

Featuring live remote telecasts from leading research centers throughout the country, Medical Horizons will take a documentary tack, portray current progress of medical science (example: use of "dry-heart" machines to assist heart surgery). Above, William Straus (left), television co-ordinator, and his assistant, Frank Garvin, scan the network of the first 45 stations to sign up for the show.

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In many cases, acid chlorides are indispensable. Advantages include better yields and conversions, shorter reaction times, lower reaction temperatures and lighter colored finished products:

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Available carload, less carload

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As acknowledged pioneers and recognized authorities in the correct use of pyrethrum, allethrin and their most effective synergists, MGK 264 and piperonyl butoxide, we offer standardized concentrates, extracts, dusts of guaranteed uniformity. If your serosols, sprays, or dusts include the use of the powerful, ask and spectacular knockdown agents, pyrethrum and allethrin, send your inquiry today. All requests for information answered by qualified authorities. Write.



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You probably aren't buying any atomic submarines, or building many helium plants these days . . . but you may be interested in some of the more common uses for ADSOR-BITE® activated charcoal, such as: Air Conditioning, Solvent Recovery, Gas Purification, Gas Masks, Liquid Purification, Water Treatment, Catalysis, Chemical Separations, Waste Disposal and Pollution Elimination.

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How Will New York State's New Salesman-Pay Law Affect You?

- 1. What chemical industries are subject to the statute?
- 2. What types of compensation are covered by the law?
- 3. Does the law apply to sales managers or supervisory personnel?
- 4. What is the status of distributors, sales agents, etc., having compensation agreements with suppliers?
- 5. To what extent are non-New York firms liable under the law?
- 6. Are salesmen of New York companies who work out-of-state
- 7. How can a salary plan meet the requirements of the act?

Paycheck Every Month

If you aren't paying your salesmen operating in New York state on a monthly basis, you're courting collision with recently effective section 196-a* of the state's labor law. Essentially, the amendment calls for at least monthly payments, is aimed at a small group of unethical employers.

Although effective two months ago, state officials have only now devised an interpretation policy for the amendment. The new law will be administered along these general principles:

- 1. Industry coverage. All industry salesmen, industrial, retail or otherwise, are covered. This includes direct representatives of chemical companies, drug detail men, specialty salesmen, and salesmen for wholesalers.
- 2. Supervisory personnel. District sales managers, and other people whose work is basically of an executive or managerial type, are not covered.
- 3. Resale men. Generally, the law is not applicable to men who have independent contractor status such as chemical sales agents or distributors.
- 4. Non-New York firms. Companies domiciled out of the state must pay its salesmen who spend all or most of their working time in New York by

a monthly plan. Time is the criterion here, not volume.

- 5. Out-of-state selling. Chemical salesmen of New York-located companies are not covered, provided all or most of their working time is spent out of New York. Again, time is the
- 6. Compensation coverage. All types of compensation are coveredincluding wages, salary, commissions, drawing accounts, advances, and special bonus or incentive payments.
- 7. Requirements. If a company's compensation system results in regular monthly payments that are a "substantial"** part of the salesman's annual earnings, it meets the law. These payments, which may run with fiscal or payroll months, must be made "on or before" the last day of the month following the month due. Special bonuses or incentive compensation paid nonmonthly must be paid no later than one month after they become due.

When sales are not made with monthly regularity, monthly payments are not mandatory. Commissions, however, must be paid before the last day of the calendar month following the due date.

Most larger chemical firms pay salesmen at least once a month. Brunt of the law's effect will be on the commission and incentive plans. But even here, companies have a generous one-month leeway to "square up."

* Section 196-a: Psyment of commissions and other remuneration of salesmen. Every person carrying on a business by lease or otherwise shall pay to each salesman in his employ, the wages, salary, drawing secount, commissions and all other remuneration due such salesmen in accordsmee with the agreed terms of employment, but in no event shall payment be made less frequently than once in each calendar month. Nothing in this section shall be construed to obviste the necessity for complying with the provision of section 196 relating to the time for payment of wages.

os "Substantial" does not carry a numerical value. Rather, it will be related to the sales-man's living requirements. In some cases of salesmen with very high income, monthly pay-ments could be less than half their annual earnings.

No ordinary coating could handle this job

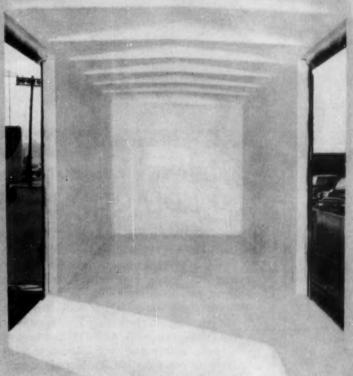


Broken planking, gaps in walls make boxcar impractical for hauling grain. Where coating stretches over badly damaged areas, glass cloth will reinforce it.



Spraying the coating. Thickness is about 5 thousandths of an inch per pass, and is built up to 20 or 30 thousandths of an inch in one operation.

Walls, floor, and ceiling are covered with a clean, impervious, plastic skin. Grain can't seep out, moisture and dust stay out.



Sprayed-on Plastic "Skin" Bridges over Cracks and Gaps to Form Smooth New Surface

A simple coating operation on the rundown, battered interior of this box-

car—and the result is a piece of Class A rolling stock!

"Railroad Cocoon," based on BAKELITE Brand Vinyl Resins, forms a tough, flexible "skin" that can be built up to 20 or 30 thousandths of an inch in thickness. After being applied, it can stretch up to 250 per cent of its length without breaking.

This coating gives your product a custom-tailored package that protects in storage and transit. Size and shape are no problem. Non-porous, resistant to weather and flame, "Railroad Cocoon" even covers and preserves permanent structures-bridges over cracks in concrete and masonry. Learn more about it by writing Dept. JM-34.

Data courtesy R. M. Hollingshead Corp., Camden, N. J.



BAKELITE COMPANY, A Division of Union Carbide and Carbon Corporation UT 30 East 42nd Street, New York 17, N. Y. The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC



ACE-ITE is a new moderately priced rigid plastic pipe with exceptional impact strength and toughness . . . handles most corrosive fluids in your plant at moderate temperatures and pressures.

For piping most inorganic acids, salts, alkalis and many organic chemicals, it's the equal of plastics that cost far more. ACE-ITE maintains good strength, rigidity and chemical resistance from minus 40 deg. F. to 170 deg. F. Light in weight, it is odorless, tasteless, non-contaminating. Saves cost of painting, immune to electrolytic corrosion and bacteria. Available in pipe sizes from ½" to 6", standard and extra-heavy, with wide variety of fittings.

ACE-ITE is only one of eight types of rubber and plastic pipe now offered by American Hard Rubber Company. Write today for free technical Bulletin 80.

ACE rubber and plastic products AMERICAN HARD RUBBER COMPANY

Control for Quality

The never-ending drive by plastics manufacturers to make fabricators toe the quality mark continues unabated. Latest individual efforts:

· A guarantee program for plastic wall tile sponsored by Dow Chemical Co. The program is offered to all wall tile producers whose product meets National Bureau of Standards Code NBS 168-50, who maintain "adequate complaint handling setups," who guarantee against defects in material and workmanship, who turn out only "mill-colored"-not dry blended-tiles, and who use Dow's brand of polystyrene. Qualified producers are provided (at cost) with printed warranties to distribute to dealers and a window emblem for distribution to company dealers.

• A kiddies' jingle contest featuring five all-expense-paid trips to Disneyland. Monsanto Chemical Co., creator of this stunt, will supply entry blanks for insertion into boxes of selected "quality" toys made from the company's polystyrene or polyethylene.

Following promotion to the retail trade in September and October (to encourage support), the contest will get a barrage of publicity. A special TV children's show running from two weeks before Thanksgiving to mid-December will promote the chosen toys. Comic book ads in color will also plug the contest. Besides the free trips, 262 secondary prizes will be offered.

By these efforts, both companies aim to encourage quality plastic products, build consumer confidence in the durability of plastic materials. "Corner-cutting" by fabricators (squeezed by high costs and competition) has been gnawing into lay opinion of many plastic items—particularly toys (CW, March 26, p. 66).

For Tomorrow's Reference: Expansible polyisocyanate resin—4-p. leaflet furnishes information on the properties and the reaction of resin to make polyurethane foam. Chase Chemical Corp. (Pittsburgh).

 Ditertiary acetylenic glycols— 22-p. brochure offers technical data on nonionic surface-active agents.
 Defoaming, viscosity reduction in vinyl plastisols and aqueous starch Paying Freight on Water is for the Nomads!



Vestvaco

(instead of T. S. P. Crystals)

If you live in a desert, it may make sense to pay for water. But in the chemical business, needless delivery charges on water is

On T.S.P. it can be important money, as these figures show: money down the drain. T.S.P. Crystals contain 56.9% water—only 43.1% anhydrous T.S.P. Thus for every 100 pounds of anhydrous Na₃PO₄ content, you pay delivery charges on 130 pounds of water. When you buy WESTVACO T.S.P. Anhydrous you pay only for active ingredient. Since the l.c.l. rate for a typical 250-mile haul is 97¢ per 100 lb.; it's easy to see how fast your savings pile up when you

You save on first cost, too. Currently, the anhydrous T.S.P. condon't pay for hauling water. tent of T.S.P. Crystals sells for \$9.74; WESTVACO T.S.P. Anhydrous for \$8,45—both prices f.o.b. on an anhydrous basis. This saving is in addition to what you save on delivery costs.

If you must use T.S.P. Crystals, we hope you are located near a producing point. If you can use WESTVACO T.S.P. Anhydrous, we can save you real money. A phone call or letter will bring an exact quotation. Why not find out right now?

*L.C.L. delivery 250 miles from producing point. Get an exact quote on your savings.

Mineral Products Division

161 East 42nd Street, New York 17 CHICAGO, ILLINOIS . CINCINNATI, OHID . HOUSTON, TEXAS . HEWARK, CALIFORNIA





With the new portable Brookfield eight-speed viscometer you can, at the flick of a switch, easily measure the viscosity of any fluid . . . readings down to 1/5 of 1 per cent with materials having viscosity of from 1 to 32 million centipoises.

If speed, accuracy, and versatility count with you, demand the new Brookfield eight-speed viscometer. A complete line of accessories makes the Brookfield adaptable to any viscosity measurement problem. Your prompt inquiry will bring complete information. Technical assistance available without obligation.

Write, wire or phone



Send the facts to:

DISTRIBUTION.

solutions, freeze-thaw additives for polyvinyl acetate emulsions, increased wetting in combination with other agents and other uses are suggested. Air Reduction Chemical Co. (New York).

• Chlorinated solvents—14-p. bulletin provides physical constants, handling information, shipping analyses, and suggested uses for methyl chloride, methylene chloride, chloroform, carbon tetrachloride, and perchlorethylene. Diamond Alkali Co. (Cleveland).

• Resin review—furnishes articles on several resin coatings, resin reactivity, and a survey of factors influencing formulation of polyesterurethane foams. No. 15, Rohm & Haas Co. (Philadelphia).

• Calcium carbonates—two technical folders give information on use in paints. One bulletin offers formulas for low sheen, high sheen, and low sheen-pure pigment thixotropic flat alkyd wall paints. Another leaflet explains the principle of extending opaque pigments with precipitated calcium carbonates. Diamond Alkali Co. (Cleveland).

 Industrial fibers—4-p. leaflet gives general description, physical and chemical properties and suggested uses for fibers derived from California redwoods. The Pacific Lumber Co. (San Francisco).

Expanding Sales Coverage:

 Neville Chemical Co. (Pittsburgh) is adding warehouse facilities in Dallas, Tex.

Vanton Pump & Equipment Corp.,
 Division of Cooper Alloy Corp., has named Backus & Spencer as northeast
 Ohio area representative for the firm's line of pumps for corrosive or hazardous liquids.

 Independent Chemical Corp. has acquired a new warehouse and bulk storage depot in New York City in the name of its subsidiary, Spielman Chemical Sales Co.

 Rexall Drug Co. is establishing a new division, Tested Products Co. (Los Angeles). It will expand and integrate company facilities for the production of drugs and toiletries sold on a contract basis.

 Warwick Wax Co., subsidiary of the Sun Chemical Corp., has chosen Cambell Chemical Co. to service and distribute company manufactures in Pittsburgh and western Pennsylvania.

			Check Glyco
Baking, ice cream, margarine, candy, other foods, and cos-	NEED THESE CHE	Aldo®	Men
metics.	Glyceryi Monostearate	Aldo	A
Sequestering unwanted metallic ions in processing textiles and synthetic rubber; preventing iron stains in laundry work; decon- taminating radioactive surfaces; improving agricultural yields and quality.	Ethylenediamine tetra- acetic acid and its salts	Tetrine®	PRIMARY,
Lubricating plastics and elas- tomers; raising melting points of waxes, asphalt, etc.; waterproof- ing electrical insulation; anti-mar compound for paints; lubricat- ing steel wire drawing.	Synthetic Wax, M.P. 140-143°C	"Acrawax" C	LARGE-SCALE
A new, efficient brominating agent.	Dimethylbromohydantoin	DMBH	PRODUCER
Highly reactive, suggested for epoxy resins and synthetic pharmaceuticals.	Ethylenediamine tetraacetonitrile	EDTN	OF MANY
Protective, moldproof, flexible coating for foods and food wrappers.	Acetylated Monoglycerides	Aldocet®	CHEMICALS
Insecticide concentrates; plasti- sol and organisol stabilizers; pharmaceutical and cosmetic emulsifiers; latex paint leveling and defoaming agents; pigment dispersants; wetting and pene- trating agents; textile lubricants; paper defoaming agents.	Non-Ionic Surfactants		WITH MANY USES
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Sure it does. It's packed in an H&D box lined with corrugated Insulpak.

insulpak is great for keeping things hot, too... and it's a superb cushion for fragile items.

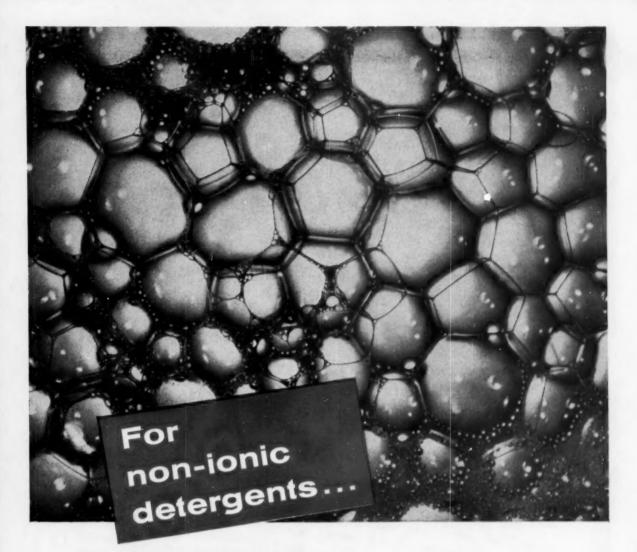
Whatever your packaging problem, H&D can give you the answer. Check us and see.



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Ethylene Oxide



Prepare non-ionic detergents by using high purity Nitrogen Division Ethylene Oxide. For reactions with such chemicals as alkyl phenols, aliphatic alcohols and fatty acids, the high purity of Nitrogen Division's Ethylene Oxide is your assurance of excellent results and a high quality product.

For information and a bibliography of pertinent literature, write for "The Manufacture of Non-Ionic Detergents from Ethylene Oxide". Ask too for samples, quotations and technical assistance.

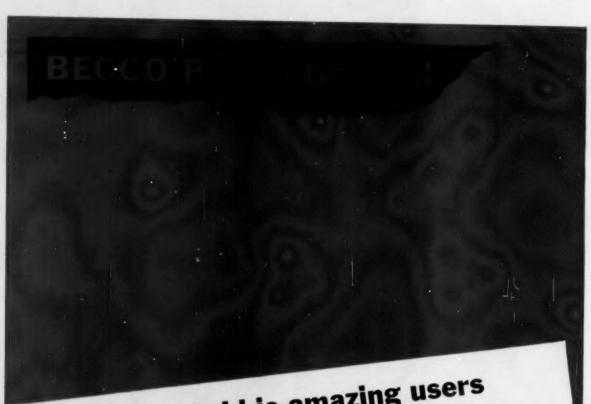
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Peracetic Acid is amazing users by its remarkable efficacy as a germicide for numerous purposes

Peracetic acid controls mold and bacterial growth . . . is particularly effective against spore-forming organisms such as B. thermacidurans and flat-sour organisms. It is also used successfully against Fusarium rot of bulbs and tubers.

In biological research, peracetic acid is used to produce germ-free conditions in a fraction of the time and at a fraction of the cost required by many other chemicals. It is of interest for sanitizing of equipment and as a germicidal wash for various products, e.g. fruits and vegetables.

Unlike hydrogen peroxide, peracetic acid is unaffected by catalase; its decomposition products are harmless or easily removed; it

presents no residue problem. Peracetic acid is low in cost and has a high rate of kill, even in low concentrations. For example: 10 ppm of peracetic acid reduce an initial count of 42,000,000/ml E. coli to zero in 1 minute.

Becco technical consultants will be glad to discuss peracetic acid and its applications. We have available Bulletins 15 and 15A on peracetic acid as a germicide and a narrative report on its use in a leading microbiological laboratory. Peracetic acid is also used for epoxidation and hydroxylation reactions. Write for Becco's complete list of bulletins on the use of Peroxygen chemicals.

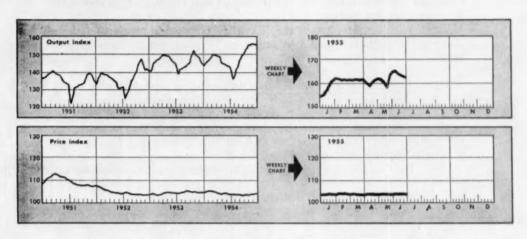
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WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year
CHEMICAL WEEK Output Index (1947-49=100) CHEMICAL WEEK Wholesale Price Index (1947=100) Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	160.8	161.0	146.5
	104.5	104.5	104.3
	470.9	460.8	307.8
MONTHLY INDICATORS—Production (Index 1947-49=100)	Latest	Preceding Month	Year
All Manufacturing and Mining All Chemical Products Industrial Chemicals	133	139	116
	160	164	164
	184	184	148

MARKET LETTER

Oct. 1 continues to be a convenient peg on which to hang price increases. That applies, of course, to contract quotes. In addition to higher caustic soda and soda ash prices going into effect then, a number of modified sodas and caustic compounds will also be advanced.

Solvay Process customers, for example, will be paying 15-25¢/cwt. more for a long list of items including the company's Snowflake crystals (sesquicarbonate of soda), laundry soda, cleansing soda, some Super Alkalis.

The Snowflake crystals are going up 15¢, to a \$2.00/cwt. level, while at the other end of the scale, the Super Alkali No. 4 will be raised 25¢/cwt., to \$4.55 in 400-lb. bbls. or drums.

A raft of fine chemicals, too, will move up on the first day of '55's final quarter. Among them, several bromides, sodium and methyl salicylates, phenylhydrazine.

By now most producers of the salicylates have followed Dow Chemical's lead in posting 3¢/lb.-higher tags (effective immediately on spot orders, incidentally). The sodium was upped to 71¢/lb., the methyl to 56¢, both l.c.l. tags.

The relatively minor bromine compounds (CW, Aug. 20, p. 83) will be boosted—from $1 \notin /lb.$, on potassium, sodium, ammonium bromides, to as much as $14 \notin /lb.$, on lithium bromide.

There's no word yet on how prices will fare for the major bromine

consumer, ethylene dibromide, the tetraethyl lead component, or elemental bromine, for that matter.

With consumption of the dibromide expected to break all records this year, though, few would be surprised to see it, too, undergo a price boost.

Prices of more rubber products are being stretched as a result of advancing latex quotations (CW Market Letter, Aug. 20).

This week, B. F. Goodrich, following Firestone's recent example, is also posting foam rubber item prices ranging from 5% to 25% higher. Consensus is that the increases would have been greater but for the moderating influence of stable synthetic rubber.

Here's a rundown of Goodrich's hikes: on various types of belting, 6-10%; industrial rubber hose, up 5.5-10%; molded industrial items, 5-10%; and some miscellaneous items, as much as 25%.

Calcium chloride is going up, too. And producers insist that the hikes are long-delayed. The salt is—and has been—in tight supply. Fact is, shipment delays may well continue to be a feature of the market for some time. Reason: increasing use in road maintenance applications.

The new quotations: calcium chloride liquor (42.5-45%), up a dollar, to \$12.35/ton; 77-80% flake, in 100-lb. bags, f.o.b. N. Y., \$2/ton higher than the previous \$27.

In contrast with the generally climbing price curve, at least one epoxy resin formulation ingredient will be sporting a lower tag. Carbide and Carbon has taken a hefty 37% cut at its alpha-methylbenzyldimethylamine, will quote these prices to customers: \$1.89/lb., c.l. drums; 10¢/lb. more than that in l.c.l. quantities. Both are f.o.b., South Charleston, W. Va.

Out of Washington, within a week or so, will come an industry-shaking policy statement on titanium. At the moment the report is plastered with a "classified" label big enough to hide its contents, but the Office of Defense Mobilization statement is expected to clarify the economic and technological facets of the currently muddled titanium situation.

Another likely topic: advisability of further expanding U. S. titanium capacity. Chances are that the ODM pronouncement will bring an end to the 20-month-long dickering between General Services Administration and Du Pont over when and if a new estimated 7,500-ton/year titanium plant should be built in Tennessee. Trade speculation has long held that delays in negotiation on DuPont's proposed \$40-million installation have centered on the surprisingly low titanium consumption rate, particularly by the military. ODM may next week shed some light on the latter.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending September 5, 1955

UP					
71	Change	New Price		Change	New Price
Calcium chloride, flake, 77-80%,			Copper chloride, anhyd., bbls., works Copper sulfate, CP, gran., bbls.,	\$.015	\$.48
100-lb. bags, c.l., works, frt. equald., ton	\$2.00	\$29.00	works, frt. equald., 100 lbs	1.00	14.50
Calcium chloride, liquor, 42.5-45% tanks, frt. equald., ton	1.00	12.35			

All prices per pound unless quantity is stated.



New Plant now in production taps natural source of sodium sulfate

West End Chemical Company now is producing Salt Cake and Anhydrous Sodium Sulfate at the rate of approximately 50,000 tons annually. These new products maintain the *premium quality* which has

characterized West End Soda Ash and Borax for over 30 years. We proudly add Salt Cake and Anhydrous Sodium Sulfate to the list of industrial chemicals carrying the well-known West End brand.

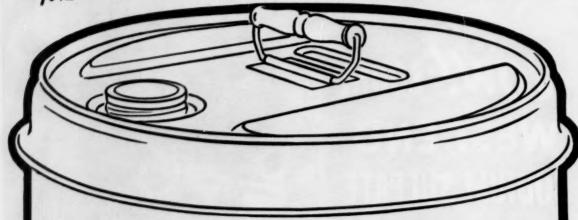


West End will be pleased to submit samples, prices and freight schedules for your evaluation upon receipt of your inquiry. We request that you include any applicable specifications governing your requirements for these products.

West End Chemical Co.

Executive Offices: Nineteen Fifty-Six Webster Bidg., Oakland 12, California · Plant: Westend, California

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ICC-approved closed head STEEL DRUMS

The fact that Continental closed head steel drums meet Interstate Commerce Commission specifications for shipping inflammable and other dangerous articles is important. Continental packaging, however, offers your products far more than rugged protection. Brightly lithographed with your name or trade mark, each container in your line becomes part of a handsome "package" family. And because customers find these cans so suitable for re-use, your sales story will keep on making good impressions for years. Let us show you how Continental drums can work for you. Call soon.

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Why not order "Tripletite" paint cans, "F" style, and conventional cans when you order steel containers. We'll send them along in one freight car to shave your costs on warehouse space, shipping and inventory. Continental makes a complete line of lug cover, flaring pails, and utility containers. Whatever your product, you'll find sizes and styles to suit your individual needs.







FOREMOST IN QUALITY AND DESIGN

Made from heavy 24- or 26-gauge steel, Continental closed head drums have a capacity of 5 U.S. gallons. Meet ICC specifications 17E and 37D. High-strength body available with straight sides or top and bottom beads. Drum top offset for easy stacking. Construction features include electric lap-weld side seam, and compound-lined, double-seamed head and bottom. Four-finger handle securely welded to top for safe handling.









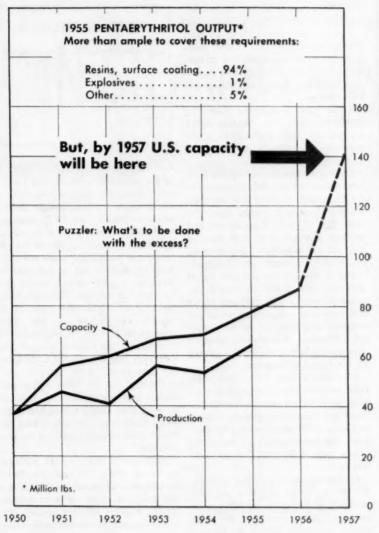
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PE Capacity: Running Wild?

Most pentaerythritol producers today are "whistling in the dark" as the specter of plant overcapacity looms in the U.S. Expansions currently under way will boost this country's potential turnout, by 1957, to some 141 million lbs./year. That's 63 million lbs. greater than this year's 77.5 million.

And makers, faced with the threatened PE glut, are admittedly hard put to foresee markets absorbent enough to take up the approaching capacity excess.

The handwriting on the wall—that now seems to spell out serious surplus problems for pentaerythritol—results from these expansion programs:

· Heyden Chemical will lead the

field with a total capacity of 49 million lbs./year when its 25-million-lb. expansion is completed. The new plant is still slated for completion by the end of 1956, but the plant site and details of its construction program are yet to be announced. Note, too, the Shawinigan and Heyden-owned St. Maurice Chemical Co., in Canada, is now able to produce about 3 million lbs./year.

Hercules Powder—whose 24-million-lb./year expansion program is now well under way, plus current capacity—will trail Heyden's projected U. S. output by a mere million pounds. Production in the new plant will begin in late 1956 or early 1957.

• Trojan Powder's new 9-10-mil-

lion-lb./year plant should be in operation within the next few months, will boost the firm's total PE capacity to 25 million lbs./year.

• Reichhold Chemical, too, is planning an expansion that will double its present capacity of 5 million lbs./year. Still in the engineering stage, onstream date is late 1956.

With the exception of Reichhold, other smaller producers are now maintaining a wait-and-see attitude. Delaware Chemical, for one, has been expanding gradually, and its present capacity is rated at 6 million lbs./year. Delaware's expansions will likely slow down for a year or two, or until PE demand shows significant increases.

Warren Petroleum is content to keep its capacity at 2.5 million lbs./year, at least for the present. And Commercial Solvents—now the smallest producer, rated at 0.5 million lbs./year—will make a move to expand only if demand for PE really perks up.

Indirectly involved in the U. S. picture is Celanese, whose subsidiary, Canadian Chemical, ships some PE into this country; but perhaps more important is the firm's competitive advantage in foreign export of pentacrythritol.

Meanwhile, Celanese still contemplates production of PE in the U.S., finds encouragement for such a move in its ability to sell its imported Canadian product at the going prices despite a handicap of 7¢/lb. (about 4.2¢/lb. duty and 3¢/lb. freight). By using the Canadian process in this country-thereby eliminating duty and chopping freight costs-Celanese hopes to win a significant competitive advantage. As yet, no definite plant construction plans have been announced, but the firm implies that a U. S. installation within 5-10 years is "more than a possibility."

Demand Dilemma: The soon-due surge in total U. S. pentaerythritol capacity naturally focuses attention on the potential growth of PE demand. But on this score, even the ambitious manufacturers seem puzzled.

The estimated total pentaerythritol production for 1955 is about 65 million lbs.* If the demand continues to grow at today's rate, production will climb to at least 76 million lbs. by '56, and probably 90 million lbs. by '57—but still a long way from the anticipa-

Of the total, 10-12% is monopentaerythritol,
 1-2% dipentaerythritol, and the remainder technical PE.



WALLACE & TIERNAN INC.

MARKETS

ted 1957 capacity of 141 million lbs. (see chart).

Alkyd resins and surface coatings, currently taking 90-95% of total penta production, will continue to expand, of course, but few expect a growth rate rapid enough to pace anticipated PE capacity.

Little, too, is expected from the explosives outlet (e.g., pentaerythritol tetranitrate). Only 1-2% of U. S. PE goes into this category, and increased take is not foreseen.

Among the markets now developing, none stands out as a definite answer to the PE surplus problem. For example, observers view with interest some relatively new PE-derived plasticizers and molding powders, but evaluation of their market potentials—and ultimate effects on PE demand—is still difficult.

Highly competitive polyols* tie in with the pentaerythritol supply/demand picture, too. Several new plants now producing—or soon to produce—synthetic glycerine are apt to disturb the PE scene. Nonetheless, possible competition fails to stir anxiety among PE producers, at least outwardly.

PE makers aver that alkyd resin manufacturers have pretty well decided what products are best made with PE, those best made with glycerine; there will be a decreasing tendency to shift from one raw material to the other, unless price differences become substantial.

If glycerine prices do show declines, PE will be forced to follow suit. But because such decreases are likely to be moderate, rather than deep, the prospect is generating little or no worry.

At present, glycerine and pentaerythritol enjoy a relatively calm coexistence, but competition will without doubt stimulate PE makers into an all-out attempt to make further inroads into the markets now held by the oldline polyhydric. But by the same token, glycerine producers will be looking for ways to crash into PE markets.

Expansion Exegesis: Under the circumstances, most often asked question is, Why are so many pentaerythritol producers expanding facilities? And further, Why do others contemplate doing so in the future?

The answer, say some, is that current expansion programs were initiated, and put into action, before the surplus-capacity specter loomed; but

* Includes Heyden's trimethylolethæne as well as similar polyols under consideration by several other producers.

PENTAERYTHRITOL

(million lbs.)

U.S.	Production	U.S. Capacity
1950	36.4	36.4
1951	45.4	56
1952	41	60
1953	56.3	67
1954	53.7	68.5
1955 (es	t.) 65	77.5

this justification can hardly apply to newer contenders. Spokesmen for the latter group generally express faith in the ultimate volume, though perhaps moderate growth rate, of PE demand.

Hercules Powder, for one, reflects this type of thinking. Based on the long-range picture, the firm's new plant probably will not run at full capacity from the outset; instead, output will be keyed to demand. Hercule's viewpoint is colored in part, too, by its captive use, which, at this time, amounts to 15% of the firm's total PE production; this relative internal consumption rate is expected to continue for some time.

Captive use by other penta producers is a matter of conjecture. At present, none admits having firm plans along these lines, although at least one reports that "we are exploring the possibilities."

Such events as the recent purchase of Synvar Corp. (Wilmington, Del.) by Delaware Chemical quickly capture the imagination of market analysts, simply because of the possible PE market impact. Synvar currently makes phenol-formaldehyde and urea resins, but the big question is whether or not the parent company plans to use some of these facilities to turn out PE resins— i.e., join the ranks of captive pentaerythritol consumers. As of today, Delaware is primarily a PE merchant.

At any rate, overemphasis of any one demand-upping possibility falls within a grasping-at-straws category. Right down the line, those closest to the PE situation express frank puzzlement over the developing supply/demand market condition, reiterate remarks heard two years ago when the capacity curve first pitched upward, "Anyone thinking about joining the PE parade must be crazy." Unless producers have some well-hidden aces up their sleeves, the comment by 1957 may be doubly apt.

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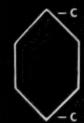
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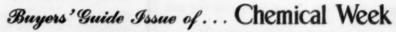
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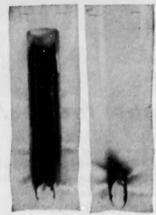
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Sample A

Sample B

EFFECTIVENESS OF SANTICIZER 141

as a flame-retarding agent shows up graphically after SPI flammability test. Sample A contained 50 parts of DOP per 100 of resin; Sample B contained 15 parts of Santicizer 141 and 35 of DOP per 100 parts of resin.

Give vinyl film an important sales "plus"—<u>flame-retardancy</u>—with Santicizer 141

When flame-retardancy in vinyl film is required or when it can provide an added sales feature for your product, be sure to check the properties of Monsanto's Santicizer* 141. Its superior fire-retardant qualities have enabled fabricators to comply with the 1954 Flammable Fabrics Act.

In addition, Santicizer 141 offers the same low-temperature flex as DOP, plus improved light stability, superior stain and oil resistance. Its strong solvent power makes possible processing at 15-30° F. lower than other standard vinyl plasticizers.

Santicizer 141 has been fully approved by the FDA as a nontoxic plasticizer for use in vinyl products such as food containers, wrapping films, beverage tubing, packaging materials, etc. which are intended for contact with food items.

For more information of Santicizer 141—just one of more than 30 different job-engineered Monsanto plasticizers, write for Tech. Bul. O-89. Check the coupon and mail today.

DIOP declared nontoxic by FDA

Monsanto's di-isooctyl phthalate (DIOP) has been approved as non-toxic by the Food and Drug Administration.

Flexible films for countless end-use applications requiring nontoxic plasticizers are now made better with Monsanto DIOP. For example:

Foods with a high water content like fresh fruits and vegetables are now being wrapped in films made with DIOP. FDA approval does not cover its use in films for wrapping foods with high fat content.

In the manufacture of beverage, milk and intravenous tubing, Monsanto DIOP also carries nontoxic approval.

The FDA has previously given full approval as nontoxic to Monsanto's Santicizers E-15, B-16 and 141.

Valuable basic data on Monsanto Penta in revised bulletin

A newly revised 12-page technical bulletin, containing general, physical, chemical and biological data on Monsanto Penta, is now available.

Included in the new booklet is an up-to-date list of literature now available on this versatile wood preservative. Improved safe-handling information and the latest classification changes in packaging, specification and shipping are also covered. On the cover page will be found information on Monsanto's recently developed Oiled Penta which includes reduced dustiness and increased solubility in oil among its advantages.

Check the coupon for your copy.

Pydraul F-9 wins UL listing: 2 new Pydraul grades developed

On May 31, 1955, Pydraul* F-9 became the world's first fire-resistant hydraulic fluid listed by Underwriters' Laboratories. From the Laboratories' Service Card: "The fire hazard of Pydraul is rated 2 to 3 in accordance with Underwriters' Laboratories, Inc.'s Standard of Classification in which ether rates 100, gasoline rates 90-100, alcohol (ethyl) rates 30-40 and paraffin oil rates 10-20."

For lubricity, stability and service life, Pydraul F-9 equals the performance of premium petroleum fluids. The Timken lubricant test shows Pydraul has a film strength of 17,500 psi, while ordinary petroleum-based fluids rate only 5000. The Almen wear tests using Pydraul showed only 2 mg. of metal lost in a 20-minute run. With petroleum oil, metal seized in one minute under the same load. Pydraul F-9 is also re-usable, noncorrosive, stable and economical.

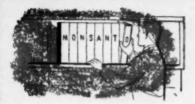
Two new grades of Pydraul are now available:

PYDRAUL 600 is a fire-resistant hydraulic fluid which delivers maximum performance where a high-viscosity fluid is required.

Designed originally for use in diecasting machines and presses, Pydraul 600 has also gained wide acceptance in other applications such as a lubricant for air compressors.

PYDRAUL 150 is designed for use in equipment where a low-viscosity fluid or low-temperature operation is required. Pydraul 150 is commonly used in regulating equipment throughout the steel industry, particularly in out-of-doors installations.

For more information on Pydraul hydraulic fluids, check the coupon.



Versatile germicide's uses, applications described in detail

All those interested in germicidal formulations will find Monsanto's newly revised booklet on Santophen* 1 a valuable production guide.

In addition to listing typical disinfectant formulations, the booklet discusses disinfectant-cleaner combinations and the role of Santophen 1 as a sanitizer in laundering and as an agent in industrial preservative applications.

Check the coupon for your copy.

Santobrite industrial preservative subject of expanded bulletin

In the revised and expanded technical bulletin on Santobrite,* Monsanto's sodium pentachlorophenate, technical, production men will find up-to-date information on solution preparation, shipping, and safe handling.

*Reg. U. S. Pat. Off.

Santobrite has proved effective and economical in the prevention of microbiological attack during the processing of such industrial products as textiles, starches, adhesives, leathers, oils and paints.

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New Monsanto aspirin plant on stream

Out of the industry's most modern plant is coming Monsanto aspirin, characterized by maximum purity and stability.

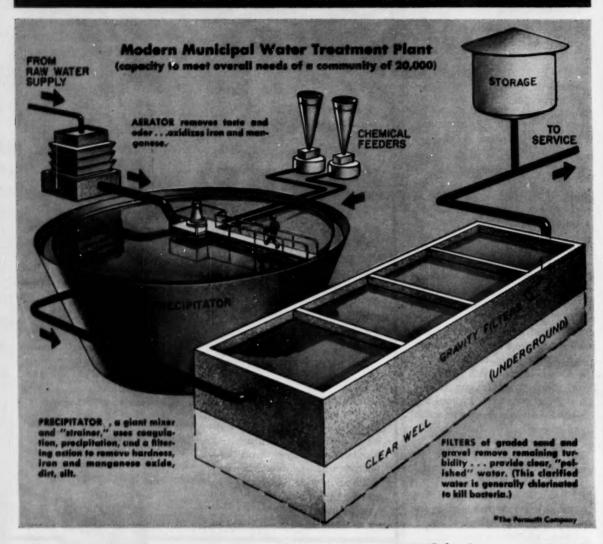
These important characteristics should be of interest to pharmaceuticals manufacturers in view of proposed USP maximum standard of .15% free salicylic acid in aspirin tablets.

The high degree of purity, essential for achieving maximum stability, is assured by Monsanto's manufacturing process in which the aspirin remains in a closed system of reactors, pipe lines, ducts and hoppers until it is ready for packaging.

In addition to uniform purity and stability, Monsanto's new aspirin retains all its long-standing advantages which make it easy and economical to handle and tablet.

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U. S. municipal water utilities distribute more "tonnage" in one day (16½ billion gal. or 68 million tons) than the nation's steel industry puts out in 6 months! But... demands by small industry, business and homes are growing sharply with a total rise of 65% since 1940. About 40% of leading U. S. cities are already in tight supply, limiting their industrial growth.

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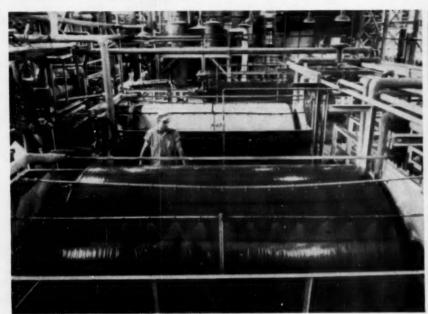
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PRODUCTION





MOULDS ARE EXTRACTED by drum filter (left) after fermentation in tanks (right) in Pfizer's new process.

New Tools, New Technique with Enzymes

New microbiological processing technique forecasts simplified production control for steroid conversion.

Together with new epoxidation reaction, it may prove a useful shortcut to more and cheaper cortisone derivatives.

Chas. Pfizer's Gilbert Shull got more than he bargained for while studying the mould Curvularia lunata. He discovered that microorganisms can be used to bring about the epoxidation of steroids. He also uncovered a new fermentation technique that could have immediate commercial significance.

Shull revealed both the new reaction and the new technique at the International Biochemical Congress in Brussels last fortnight. The epoxidation is largely of interest to researchers at the moment. The new technique, on the other hand, could well be ready for commercial equipment right now. Conceivably, it could be used by Pfizer in its production of hydrocortisone. This is the background:

All fermentations—whether carried out in flasks or in large tanks—have at least one procedure in common: the microorganisms are allowed to grow in the fermentation vessel, and when growth is well established, the material to be transformed or converted is added.

Shull in his studies, however, discovered that certain steroid changes are not directly dependent on the growth process. Instead, they're catalyzed by enzymes produced by the microorganisms. In production terms, this means that larger batches could be handled with less critical control by separating the growth and conversion steps of the operation.

In the new method, for instance, microorganisms would be grown in large fermentation tanks—as before—for several days. The mycelium (vegetative part of the mould) would then be filtered off from the broth with a filter aid. Then, the mycelium would be resuspended in water, and the compound to be changed would be added.

The enzymes contained in the mycelium serve only to catalyze the desired steroid conversion, are not consumed or altered in any way. All the enzymes are recovered by subsequent separation from the steroid product and, theoretically, can be used over and over until accumulated poisons render them ineffective.

This technique would not be applicable to certain fermentations (like citric acid, Terramycin) that depend on the growth process of the microorganisms. It could prove a valuable tool in many industrial fermentations, however. For example, although Pfizer's (and Upjohn's) hydrocortisone patents cover conversion in a growing medium, it's entirely possible that the product might be amenable to the simplified separation.

Old Story: If so, it wouldn't be the first time that microorganisms have lent a helping hand to the cortisones. Early in the development, microbiological oxidation solved the problem of adding a keto group in the 11 position of the steroid nucleus. Prior to that, cortisone was derived only in small quantities from relatively scarce steroids (e.g., ox bile), or from tricky, multistep chemical synthesis.

As an alternate route to hormones, fermentation permitted the use of several more-abundant steroids, such as ergosterol. And the highly selective reactions of the microorganisms required far fewer steps than did total chemical synthesis.

For one thing, biochemical conversion obviates the necessity of protecting bonds that must remain unaffected by oxidation, other strong reactions. For not only the reaction, but also the location at which it occurs within the steroid molecule is a characteristic of the particular mould employed.

Too, microorganisms can be made to increase their activity in the desired direction and, thereby, improve the yield of steroid product. Unlike a strictly chemical synthesis, the yield of which is more or less fixed, microbiological reactions depend on the bugs' ability to produce enzymes. And this can be altered by causing mutation of the organism.

Common mutation-inducing devices include: ultraviolet light; chemical agents, such as the mustard gases; X-ray and other types of irradiation. Mutation can't cause a particular mould strain to produce new enzymes, or uncharacteristic conversions. But it can, and does, increase the yield of steroids by causing the mould to make more of the desired enzyme at the expense of the less important ones.

To date, microorganisms have been used to add hydroxyl groups, reduce side chains, add or take away hydrogen, enlarge rings from 5 to 6 members, swap hydroxyl for ketone groups. And now, epoxidation of unsaturated steroids is added to this array of versatile capabilities.

Shull first hit on the epoxidation reaction when Curvularia lunata, an 11\beta-hydroxylating culture, unexpectedly produced a fermentation product that proved to be identical with an epoxide formerly produced only by chemical synthesis.

Further investigation proved that the epoxidation was not accidental, suggested that it may be possible with many other steroid-mould combinations. Apparently, says Shull, all that's needed to produce epoxides microbiologically is a steroid with an isolated double bond and a culture capable of introducing an axial hydroxyl group at the site of unsaturation.

Though their ultimate usefulness is yet to be explored, Pfizer predicts a thorough workout for both of Shull's discoveries.

Solutions Needed

The advent of complete automation might bring solutions of many problems. But right now, the subject is raising more questions than it's answering. That was clearly evidenced last fortnight at the symposium on Electronics and Automatic Production, in San Francisco, sponsored cooperatively by the National Industrial Conference Board and the Stanford Research Institute.

The chemical process industry was well represented at the conclave: 69 out of the total attendance of 501 came from chemical and allied firms. By and large, however, the formal talks dealt with topics not directly tied to chemical processing. The typical chemical engineer who went to San Francisco, in fact, probably got more out of informal talks outside the formal sessions. There, the prime topics of con-

versation were these questions:

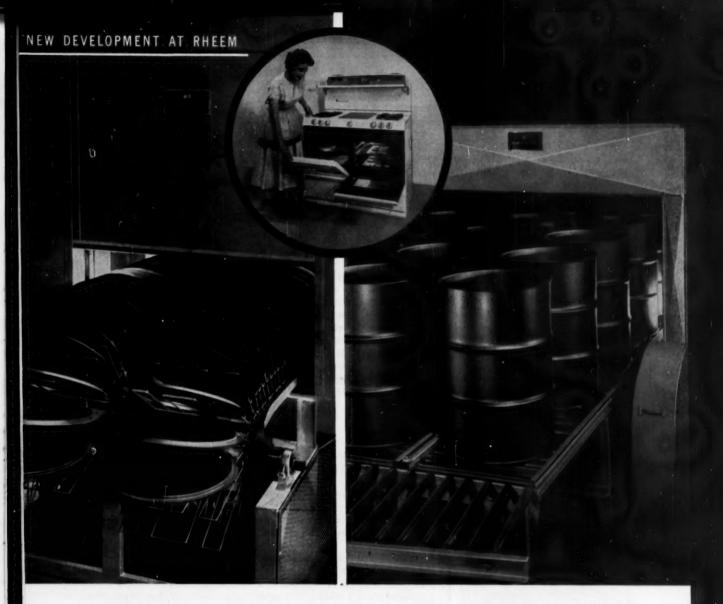
- Where should the emphasis be placed—on general-purpose computers and data-handling equipment, or on the more economical (though also more limited) special-purpose computers and data-handling equipment for specific jobs? Admiral Furth, chief of naval research, for one, feels that automatic data handling could be improved by the use of special-purpose equipment. In the same line, some questioned whether or not the digital computers are not getting too big a play by some—to the neglect of analog computers.
- Will there be enough engineers available? A small or medium-size company cannot usually afford a full-time engineering staff working on control engineering problems. By the same token, a components manufacturer can't afford to provide the necessary engineering skills and services for a



Big Push for Clean Air

THESE TWO LARGE catalytic chambers will soon be joined by a third, which will employ the largest platinum alloy catalyst bed ever fabricated. Designed and built by Catalytic Combustion, they're Barrett's answer to the air pollution problem at its Philadelphia phthalic anhydride plant. The tail gas from the operation contains traces of phthalic

and maleic anhydrides along with some aldehydes and other irritating by-products. By means of a gasburner and a heat exchanger, the gas is brought up to temperature and then catalytically converted into carbon dioxide and water. In the oxidation, the temperature is raised further so the gas is returned to heat the incoming stream.



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It's the same idea as the cookies and cakes. Because the drum tops and bottoms are smaller in size, they need less time in the oven. So Rheem engineers decided they would be first to do the curing job right... to use two ovens.

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myriad of small customers without receiving repayment. Minneapolis-Honeywell's president, Paul Wishart, is one of the most ardent advocates of the largely untapped volume market, expects that eventually the industry will tend toward sales of packages including the necessary engineering, installation and service as well as the components.

- How and when can costs be brought down? This is like the old question about the chicken and the egg: the suppliers cannot cut costs until they expand and prosper. And they can't expand and prosper until they tap volume markets. And they can't tap volume markets until they cut costs.
 - What can be standardized? To tap



Fast Communications

TO ASSIST its quality control program, Chemstrand is expanding the use of Western Union's Intra-Fax Facsimile communications system at its Pensacola plant. The system, capable of reproducing sketches as well as hand- and typewritten messages, is being installed to transmit analytical data from the Central Laboratory to various control rooms spotted around the plant. R. C. Gessert, manager of Western Union's Pensacola office, is explaining the equipment to Chemstrand's plant manager, F. G. Gronemeyer.

the volume market, equipment makers have to standardize equipment and components. Complete standardization is impossible, of course, but there's a great amount that can be done.

There are economic questions involved, too. Primarily: Is automation a deflationary or inflationary influence? Even more basic: What is a good working definition for automation? If all those discussing the subject could be sure they were talking about the same thing, the problems would be a good deal easier to tackle.

Grime Doesn't Pay

Cleanliness is not only next to godliness. It's your strongest ally in the war on occupational dermatoses* in your plant, concludes Dr. Louis Schwartz, retired Medical Director of the U.S. Public Health Service, in his new monograph, "The Prevention of Occupational Skin Diseases."

But though plain cleanliness is probably the most important single weapon in the fight, there are several others that shouldn't be overlooked.

Low-Pressure Sales: The booklet is published by the Assn. of American Soap and Glycerine Producers Inc., which is naturally interested in pushing the idea of cleanliness. But actually the sell is decidedly low-pressure and the book is a worthwhile contribution to the field.

Schwartz starts off by stressing the increasing incidence of dermatoses in plants. He surveyed 117,000 workers, discovered about 1,400 (1.2%) cases of occupational dermatoses. Not surprisingly, the largest percentage was found in the process industry. For instance, 53 of 700 workers (7.5%) examined in synthetic resin plants had dermatoses, and 176 out of 2,500 (7.0%) chemical and dye workers were affected.

Similarly, an analysis of over 41,-000 cases of occupational dermatitis reported by state compensation boards showed that 18.8% of the workers had been exposed to petroleum products and greases, 11.7% to alkalis and cements, and 7.8% to solvents.

Ounce of Prevention: Schwartz devotes an entire chapter to methods of lowering these percentages. These are some of the points he makes:

• The place to start a program to

Which covers any abnormality of the skin. Dermatitis, the narrower term, is an inflammation of the skin.



In the BUYERS' GUIDE, G. Jay Anyon of the Wharton School of Business and Harold Jones of Du Pont tell How to Purchase Capital Equipment. If you've a voice in how your firm is spending its money for capital facilities, you'll want to read their suggestions and cautions.

minimize occupational dermatoses is in the design and construction of the plant. It should be designed so that irritant chemicals are enclosed. Both new and old buildings should be adequately ventilated.

 Personal cleanliness he cites as the single most important measure.
 This can be promoted by easily accessible, well-furnished wash rooms.

• Environmental cleanliness (good housekeeping) can be almost as important. It not only builds morale, but also lessens the chances of direct contact with an irritant.

 New workers should be examined carefully. Workers with a history of skin diseases or allergies should not be placed in areas where there are wellknown dermatological hazards.

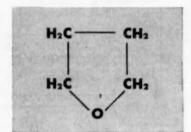
 Protective clothing should be kept in good repair and clean. Protective ointments and creams, though not so effective as protective clothing, have a psychological edge in that workers often prefer them.

• Wherever possible, substitute for chemicals that may be troublemakers. As an example of what can be done on this score, he points to the development of substitutes for hexamethylenetetramine as a rubber accelerator; the use of high-test naphtha instead of benzene in the manufacture of rubber cement; and the substitution for beryllium in fluorescent light manufacture.

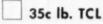
• It doesn't make any difference how much equipment you supply the workers, of course, if they don't know how to use it. So an important aspect

What's Your "Price I.Q." on These Furan Chemicals from Du Pont?

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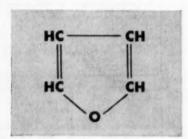


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FURAN



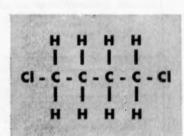
20c lb. TCL



33c lb. TCL

You get a perfect score on this part of the quiz if you chose 33 € lb. * as the price of furan. The furan ring structure appears in many physiologically active, naturally occurring compounds. For this reason, the chief interest in furan has centered on its use as an intermediate in the production of pharmaceuticals and plant growth regulants.

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32c lb. TCL

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P-7486 Chemical Week

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P-7635 Chemical Week
330 W. 42 St., New York 36, N. Y.

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ES.7410 CHEMICAL WEEK

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Provide greater financial and mana-gerial strength through the pooling of resources and experience.

Prefer companies with net worth of \$756,800 less. Group could include one or two companies where present ownership desires retirement with five years. This plan perticularly designed in privately owned companies like ours where i heritance problems may be a factor,

BO-7639 CHEMICAL WEEK

330 W. 42 St., New York 36, N. Y.

of any antidermatoses program is to indoctrinate the employees on the proper utilization of the equipment. This can be done, Schwartz suggests, by posters and placards strategically spotted throughout the plant. Also, he points out, dermatoses should be a major topic at regular safety meetings. Another thing to remember: periodic inspection of hands will help to uncover cases in the early stages.

But just as important, it will make workers conscious of the possibility of contracting dermatitis.

Hot Canned Pump: Chempump Corp.'s (Philadelphia) two new canned-motor pumps incorporate a secondary impeller and water-cooled heat exchanger to permit handling fluids as hot as 1000 F. Model CHS and Model CFT pumps deliver up to

GEUDER, PAESCHKE & FREY CO. 36 GRACE CHEMICAL CO., DIV. OF W. R. GRACE & CO.
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250 gpm. at heads to 195 ft.

Touch Control: The precision-machined Micro-Valve now offered by High Pressure Equipment Co., Inc. (Erie, Pa.) permits micrometer control at pressures to 60,000 psi. It features a positive stop at zero opening, opens only 0.015 in. for each complete revolution of the stem, comes in tubing sizes up to \(\frac{9}{16} \) in.

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